

**A BIOLOGICAL INVENTORY AND
EVALUATION OF SHORT HILLS
PROVINCIAL PARK**

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**Ministry of
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Resources**

**Lyn McLeod
Minister**

**A BIOLOGICAL INVENTORY AND
EVALUATION OF SHORT HILLS
PROVINCIAL PARK**

J. GOULD

1989

PREPARED FOR:

**ONTARIO MINISTRY OF NATURAL RESOURCES
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PREFACE

A biological inventory of Short Hills Provincial Park was conducted to: a) identify the vegetation, flora and fauna occurring within its boundaries, and b) to identify and map the significant features.

Background information was compiled and plant communities delineated on aerial photographs (1:10,000 scale) prior to fieldwork. All habitat types were visited at least once over the course of the field season. Dates of field work were June 27, 28, 29, July 12, 13, August 8, 16 and 31, 1988. The vegetation of each plant community was described and a species list compiled for each. Due to the late initiation of fieldwork, information on early spring flora was missed. In addition to the vegetation, environmental parameters such as soil type and moisture, microclimate and degree of disturbance were noted. Breeding birds were assessed using the procedures outlined for the Ontario Breeding Bird Atlas (Eagles and Cadman, 1983). Incidental observations of herptiles, butterflies and mammals were also noted. The format of the report and the definitions and criteria used in it follow those provided in the Terms of Reference for this study.

Several individuals aided in the production of this report and their help is gratefully acknowledged. John Riley, Regional Ecologist, Ontario Ministry of Natural Resources (OMNR), Richmond Hill, provided direction for the study. John Fraser, Parks Supervisor, Niagara District Office, Ontario Ministry of Natural Resources, provided background information. Don Fraser, Gartner Lee Limited helped with fieldwork providing lists of sightings of birds, reptiles, amphibians and butterflies. He also reviewed a draft of this report. Discussions with Don Sutherland, Gartner Lee Limited, were useful in the determination of the status of plant species in the Regional Municipality of Niagara. Dave Osmond, Gartner Lee Limited, served as Corporate Advisor to the project.



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ABSTRACT

Gould, J. 1989. A Biological Inventory and Evaluation of Short Hills Provincial Park. Prepared for Ontario Ministry of Natural Resources, Parks and Recreational Areas Section, Central Region, Richmond Hill. 30 pp.

Short Hills Provincial Park contains a diversity of plant communities representing forested ravines and uplands, as well as floodplains and several communities of anthropogenic origins. There are two life science Areas of Natural and Scientific Interest (ANSIs) within the Park, one of which represents vegetation of the dendritic valley, the other the re-entrant valley of the Short Hills Kame (Macdonald, 1976a&b).

Approximately 50% of the area of the vegetation of the Park is the direct result of the influence of man, while the remainder is predominantly native. Much of the native vegetation consists of remnant woodlots with small isolated marshes.

Three provincially rare and four regionally significant plants were observed in the Park in 1988. An additional three provincially and regionally rare species have been recorded from the Park by others (Walshe, 1970; Beechey and Macdonald, 1971). In addition, four species of birds which are rare in the Regional Municipality of Niagara were recorded during the course of this study.

Twelve Mile Creek, the only coldwater stream within the administrative boundaries of Niagara District, flows through the Park.

Much of Short Hills Provincial Park is considered to be sensitive to development due to steep slopes, silty clay soils, and the natural and successional vegetation of much of the park.

CHAPTER I REGIONAL BACKGROUND

(i) INTRODUCTION

(a) Location

Short Hills Provincial Park is located in the Town of Pelham and the Cities of Thorold and St. Catharines, Regional Municipality of Niagara. It is situated five km north of Fonthill and is approximately 70 km south of Metropolitan Toronto. The outskirts of St. Catharines lie about 8 km to the northeast (Figure 1).

(b) Status

Short Hills Provincial Park is 688 ha in size. There are two provincially significant life science Areas of Natural and Scientific Interest (ANSIs) within the Park boundaries. These are Dry Falls Valley (Short Hills Provincial Park I) and Twelve Mile Creek Valley (Short Hills Provincial Park II) which are 12 and 67 ha in size respectively. Dry Falls Valley is contained entirely within the Park, while 5 ha of the Twelve Mile Creek Valley ANSI are in private ownership.

(c) Planning Background

Short Hills Provincial Park was originally called Effingham Provincial Park. A master plan for the Park was approved in 1977 (OMNR, 1977) and, in it, a number of special natural features were outlined. Significant biological features were identified by Beechey and Macdonald (1971) and significant geomorphological and geological features were identified by Davidson (1974). It was on the basis of these reports that several 'natural zones' were proposed (OMNR, 1977).

The Park includes one IBP Site, the DeCew Falls Floodplain. This area contains a stand of Pawpaw (*Asimina triloba*) (Walshe, 1970).

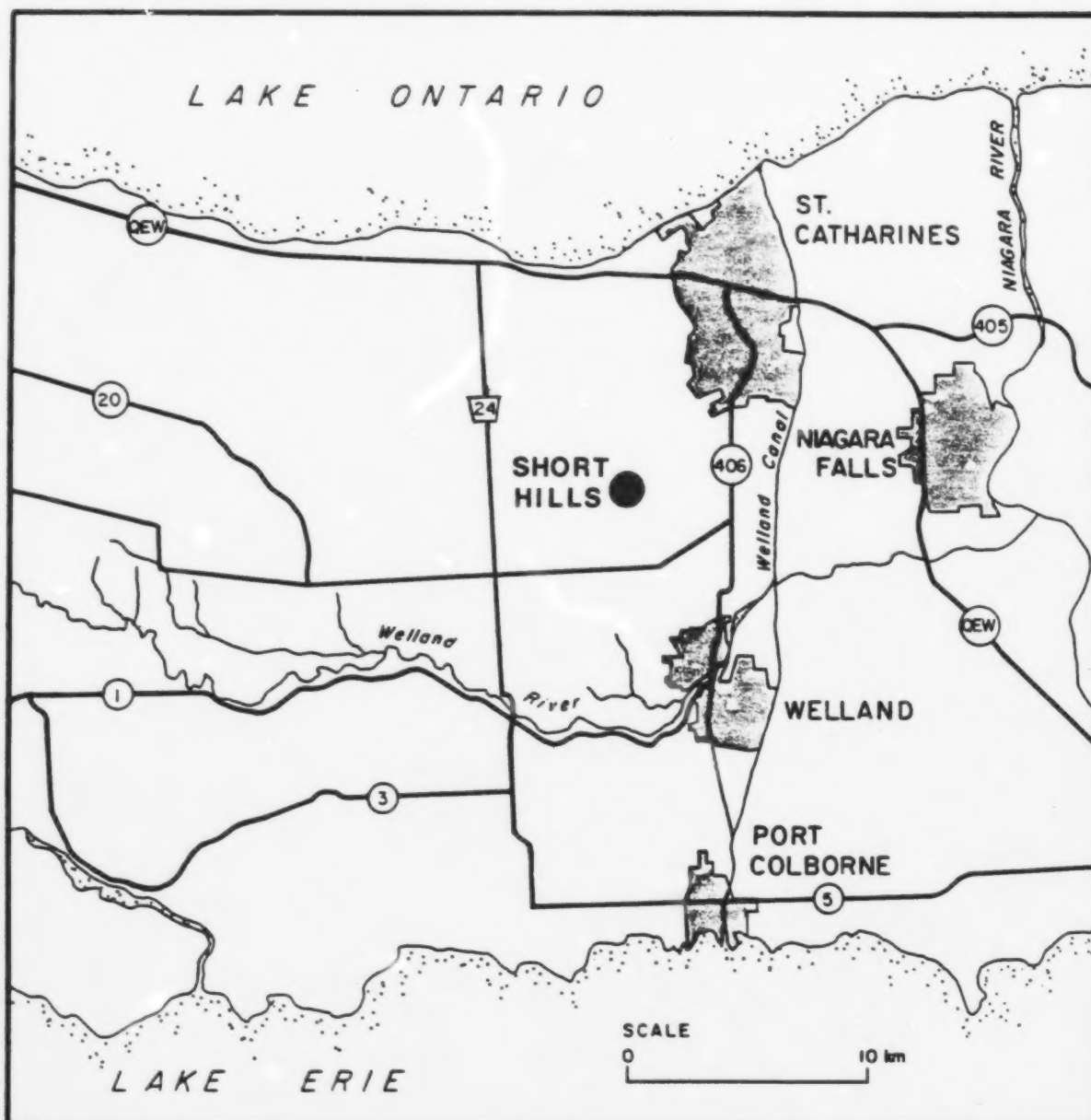


FIGURE 1

Location of Short Hills Provincial Park



GLL PROJECT 88-227



Two provincially significant Areas of Natural and Scientific Interest (life science) were identified within the Park during an evaluation of areas within the Niagara Escarpment Planning Area (Cuddy *et al.*, 1976). Dry Falls Valley was chosen to represent the vegetation patterns associated with the re-entrant valley of the Short Hills Kame (Macdonald, 1976a). Twelve Mile Creek Valley illustrates the vegetation that is representative of the "dendritic valley of the Short Hills Dissected Kame" (Macdonald, 1976b). In addition to the life science Areas of Natural and Scientific Interest, there are two provincially significant earth science ANSIs. Much of the Dry Falls ANSI is included within the Dry Falls Creek Valley earth science site. The other earth science ANSI, Terrace Creek, was identified solely for its earth science features. Dry Falls Valley and Twelve Mile Creek Valley are two of 23 life science Areas of Natural and Scientific Interest included in the Land Use Guidelines for Niagara District (OMNR, 1983).

Short Hills Provincial Park has been identified as, "an area of special investigation, an area deserving separate recognition as a[n] Environmentally Sensitive Area" in a study of Environmentally Sensitive Areas in the Regional Municipality of Niagara (Brady, 1980, p. 340).

Short Hills Provincial Park is designated as a nodal park (natural environment) within the Niagara Escarpment Parks system (Ontario Ministry of Municipal Affairs, 1985).

Twelve Mile Creek is the only coldwater stream within the administrative boundaries of Niagara District (OMNR, 1983) and it supports a native population of brook trout (*Salvelinus fontinalis*) (Fraser, 1988).

The Park was also the release site for 34 Wild Turkeys (*Meleagris gallopavo*) in the winter of 1986 (Fraser, 1988).

A Boy Scout camp is located on a parcel of private land within the Park.

There are several corridors (3 hydro and 1 pipeline) bisecting the Park.

(d) Recreational Usage

Short Hills Provincial Park is currently used for a variety of day use activities. These include hiking, horseback riding, cross country skiing and snowmobiling. There are several established trails throughout the Park, such as the Bruce Trail, snowmobile and cross country ski trails. In addition, there are several paths which have been formed as a result of continued traffic over them. Off-road vehicles also use the Park, although this activity is prohibited. Estimates of overall park visitation rates are unavailable because of the numerous unmonitored access options available to user groups.

(ii) REGIONAL CONTEXT

Hills (1959) divided the Province of Ontario into a series of units (Site Regions) within which the vegetation responds to a landform feature in a consistent manner. He further subdivided these Site Regions into Site Districts, a subdivision based primarily on physiography. Short Hills Provincial Park is found in Site District 7-2, the St. Thomas Site District (Hills, 1959). This is characterized as a limestone clay plain overlain by sand.

The St. Thomas Site District is included in the Niagara Section of the Deciduous Forest Region, as described by Rowe (1972). Forests dominated by Sugar Maple - American Beech with Red and White Oak typify normal sites in this Section and Site District. Associations of Oak-Hickory and Oak-Chestnut are found on normal dry and hot dry sites respectively. Tulip Tree-Walnut and Sycamore-Tulip Tree associations occupy hot mesic and hot wet sites. Coniferous species such as Eastern Hemlock, Balsam Fir and Eastern White Cedar are frequent in cooler areas.

(iii) PHYSICAL BACKGROUND

(a) Physiography

Short Hills Provincial Park is situated on the Haldimand Clay Plain Physiographic Region, as described by Chapman and Putnam (1984). It is also traversed by the Niagara Escarpment.

(b) Geology and Geomorphology

The geology and geomorphology of Short Hills Provincial Park have been described in detail by Davidson (1974) and OMNR (1988). In summary, the Park is contained within the re-entrant valley of Twelve Mile Creek. This valley was cut by a preglacial river. A series of proglacial lakes was formed with the retreat of the Wisconsin ice sheet. Deposition of sediments in these lakes and their subsequent erosion has resulted in the topography which presently characterizes the Park. The Niagara Escarpment is exposed in places where the streams have cut through these deposits to bedrock, such as at Dry Falls, along Dry Creek, and along Terrace Creek.

(c) Soils

The soils of Short Hills Provincial Park are primarily lacustrine silty clays of the Beverly and Brantford series, while those of the valley bottoms are mainly lacustrine silt loams of the Tuscola series (Ontario Institute of Pedology, 1988).

CHAPTER II THE VEGETATION OF SHORT HILLS PROVINCIAL PARK

(i) INTRODUCTION

Short Hills Provincial Park consists of forested uplands, slopes and valley bottoms. There are a few areas of marsh associated with Twelve Mile Creek. Much of the Park was cleared for agriculture at one time and fields in various stages of succession are now well represented in the Park.

(ii) COMMUNITY DESCRIPTIONS

A brief description of the plant communities found within Short Hills Provincial Park is provided below. The location and areal extent of these communities is presented in Map 1. In general, the boundaries between different community types are not distinct and therefore, the lines provided on the map must be taken as the best approximation at a 1:10,000 scale.

The distribution of the plant communities in the study area is related primarily to soil moisture. The relationship of the vegetation to environmental parameters is presented on a vegetation matrix (Figure 2).

The sizes of the plant communities are outlined in Table 1.

MARSH

1. Cattail - Sedge

There are a few areas of marsh in the Park. These are associated primarily with the floodplain of a tributary of Twelve Mile Creek. Cattail (*Typha angustifolia* and/or *T. latifolia*) dominates these areas although other species such as Water-parsnip (*Sium*

Moisture Substrate regime Temp.		Arid	Very Dry	Dry	Dry Mesic	Mesic	Wet Mesic	Wet	Very Wet	Saturated	Open Water
Colder	Rock										
	Sand										
	Loam									1	
	Clay										
	Organic										
Normal	Rock										
	Sand										
	Loam					2e					
	Clay			2a,c,d,4, 5a,6a,b,7	2a,b,d,e, 3,4,5a,b,c, 6a,b,7	2e,f,3					
	Organic										
Warmer	Rock										
	Sand										
	Loam										
	Clay										
	Organic										

FIGURE 2: Vegetation Matrix for Short Hills Provincial Park

- | | |
|------------------------|------------------------------|
| 1. Marsh | 4. Hawthorn Thicket |
| 2. Deciduous Forest | 5. Plantation |
| a) Sugar Maple | a) White Pine |
| b) Trembling Aspen | b) White Pine - Red Pine |
| c) Large-toothed Aspen | c) White Pine - White Spruce |
| d) Butternut | 6. Old Field |
| e) Black Walnut | a) Grasses |
| f) Black Maple | b) Grasses - Pine/Spruce |
| 3. Mixed Forest | 7. Cultivated Field |

TABLE 1 SIZE OF PLANT COMMUNITIES OF SHORT HILLS PROVINCIAL PARK

PLANT COMMUNITY	APPROXIMATE SIZE (ha)	RELATIVE SIZE (%)
1. Marsh	2.7	0.4
2. Deciduous Forest		
a. Sugar Maple	303	44
b. Trembling Aspen	<1	<0.1
c. Large-toothed Aspen	1	<0.2
d. Butternut	<1	<0.1
e. Black Walnut	27	4
f. Black Maple	4.8	0.7
3. Mixed Forest	2.7	0.4
4. Thicket	<1	<0.1
5. Plantation		
a. White Pine	2.7	0.4
b. White Pine-Red Pine	1	<0.2
c. White Pine-White Spruce	1	<0.2
6. Old Field		
a. Grasses	206	30
b. Grasses-Pine/Spruce	34	5
7. Cultivated Field	<u>103</u>	<u>15</u>
TOTAL	688	100

suave), sedges (*Carex cristatella*, *C. hystericina*) and Black Bulrush (*Scirpus atrovirens*) are represented.

The soils are saturated silty loams and the microclimate is cooler than normal.

DECIDUOUS FOREST

2(a). Sugar Maple (*Acer saccharum*)

Most of the forested upland areas of Short Hills Provincial Park are dominated by Sugar Maple (*Acer saccharum*). All of these forests have been logged or selectively thinned in the past and thus the stands are of different ages. The youngest stands are dominated by Sugar Maple, with Hop-hornbeam (*Ostrya virginiana*), Trembling Aspen (*Populus tremuloides*) and American Basswood (*Tilia americana*). The more mature stands contain species such as American Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana*) and Red Oak (*Quercus rubra*). These species may dominate or co-dominate with Sugar Maple in some areas. Other species occurring with less frequency within these relatively mature stands include White Oak (*Quercus alba*), Tulip Tree (*Liriodendron tulipifera*), Black Cherry (*Prunus serotina*), Shagbark Hickory (*Carya ovata*) and American Chestnut (*Castanea dentata*).

Regeneration is primarily of Sugar Maple, represented as both seedlings and saplings. White Ash seedlings are also common in some areas but saplings of this species are rare. In addition to Sugar Maple, saplings of Shagbark Hickory and Hop-hornbeam occur. These species also occur as seedlings as do American Beech, Tulip Tree, Basswood, and White Oak.

Over much of the area, the understory vegetation is sparse and consists of Zig-zag Goldenrod (*Solidago flexicaulis*), Bottle-brush Grass (*Elymus hystrix*), Small Enchanter's Nightshade (*Circaea alpina*), Enchanter's Nightshade (*C. lutetiana*) and False Solomon's-seal (*Smilacina racemosa*). Seedlings of White Ash and Sugar Maple are also common. There are areas which support a richer ground flora with Blue

Cohosh (*Caulophyllum thalictroides*), Bloodroot (*Sanguinaria canadensis*) and Twin-leaf (*Jeffersonia diphylla*).

The soils are silty clays and the moisture regime is dry mesic to mesic.

Significant features of this community include Tulip Tree, American Chestnut, White Wood Aster (*Aster divaricatus*), Narrow-leaved Spleenwort (*Athyrium pycnocarpon*) and Hay-scented Fern (*Dennstaedtia punctilobula*). Green Violet (*Hybanthus concolor*) has been reported from this community type (Beechey and Macdonald, 1971).

The topography of Short Hills Provincial Park is undulating and this forest type occupies both the tableland and the upper portions of some of the slopes of the ravine systems.

2(b). Trembling Aspen (*Populus tremuloides*)

One small area of Trembling Aspen occurs beside an old field at the edge of a ravine. The understory is primarily seedlings of White Ash and Sugar Maple, with Maple-leaved Viburnum (*Viburnum acerifolium*).

Soils are dry mesic silty clays and the microclimate is normal.

2(c). Large-toothed Aspen (*Populus grandidentata*)

Young forests of Large-toothed Aspen ring both a plantation of White Pine (*Pinus strobus*) and an old field in the Park. Hop-hornbeam is also common in the lower canopy. The understory vegetation is sparse, comprised primarily of White Ash seedlings.

Soils are dry silty clays and the microclimate is normal.

2(d). Butternut (*Juglans cinerea*)

There is an area dominated by Butternut that occurs along Holland Road. The stand is composed primarily of introduced species such as Lilac (*Syringa vulgaris*), Apple (*Malus domestica*), Garlic Mustard (*Alliaria petiolata*) and Kentucky Blue Grass (*Poa pratensis*).

Soils are dry to dry mesic silty clays and the microclimate is normal.

2(e). Black Walnut (*Juglans nigra*)

Areas dominated by Black Walnut are scattered throughout the study area. The trees are widely spaced on upland knolls and/or terraces giving the community a savannah-like appearance. On the floodplains, the trees are more closely spaced, often with Crack Willow (*Salix fragilis*) and Weeping Willow (*S. alba*) as subdominants. Other associates of this community type include White Elm (*Ulmus americana*) and Red and/or Green Ash (*Fraxinus pennsylvanica* var. *pennsylvanica* and var. *subintegerrima*, respectively). The ground cover consists of Canada Blue Grass (*Poa compressa*), Orchard Grass (*Dactylis glomerata*), White Avens (*Geum canadense*) and Jumpseed (*Polygonum virginianum*).

Pawpaw and Burning Bush (*Euonymus atropurpureus*), two provincially rare species, have been reported in one area dominated by Black Walnut (Walshe, 1970).

The soils range from dry-mesic silty clays on the uplands to mesic silty clays and wet-mesic silty loams on the lower slopes and floodplains. The microclimate is normal.

2(f). Black Maple (*Acer nigrum*)

Stands dominated by Black Maple occupy some of the bottomlands and lower slopes of the ravine systems. Other associates of this community include Blue Beech (*Carpinus caroliniana*), American Basswood, Hop-hornbeam and White Ash and in some areas, Eastern Hemlock (*Tsuga canadensis*). The understory of these stands is

rich with Wild Ginger (*Asarum canadense*), Meadowrue (*Thalictrum dioicum*), Jack-in-the-pulput (*Arisaema triphylla*) and Blue Cohosh.

Soils are mesic silty clays and the microclimate is normal.

MIXED FOREST

3. Sugar Maple - American Beech - Eastern Hemlock (*Acer saccharum* - *Fagus grandifolia* - *Tsuga canadensis*)

A forest of Sugar Maple - American Beech - Eastern Hemlock occurs on the north facing slopes of the deep ravine systems in the southern portion of the study area. Eastern Hemlock is restricted to these slopes and the bottoms of the ravines. In those areas where Hemlock is common, there is little understory. Several ferns such as Marginal Wood Fern (*Dryopteris marginalis*), Glandular Wood Fern (*Dryopteris intermedia*) and Northeastern Lady Fern (*Athyrium filix-femina*) occur.

The soils are dry-mesic to mesic silty clays and the microclimate is cooler than normal. Significant features of this community include Narrow-leaved Spleenwort and Tulip Tree.

THICKET

4. Hawthorn (*Crataegus* spp.)

There is one small area dominated by hawthorn situated between a road allowance and the Bruce Trail. The trees are approximately 8 m in height and the understory vegetation consists of some Garlic Mustard and White Ash seedlings.

Soils are dry to dry mesic silty clays and the moisture regime is normal.

PLANTATION

5(a). White Pine (*Pinus strobus*)

There are several plantations of White Pine scattered throughout the Park. The canopy is closed and there is virtually no understory vegetation.

Soils are dry to dry mesic silty clays and the microclimate is normal.

5(b). White Pine - Red Pine (*Pinus strobus* - *Pinus resinosa*)

There are plantations of White and Red Pine in which the canopy is closed and the understory vegetation is absent.

Soils are dry mesic silty clays and the microclimate is normal.

5(c). White Pine - White Spruce (*Pinus strobus* - *Picea glauca*)

Plantations of White Pine with White Spruce also occur within the Park. The canopy is closed and there is no understory vegetation.

Soils are dry-mesic silty clays and the microclimate is normal.

OLD FIELD

6(a). Grasses

There are several areas of old field contained within the boundaries of Short Hills Provincial Park. These are in various stages of succession although all exhibit the same general composition of the herbaceous vegetation. Grasses dominate particularly Orchard Grass, Timothy (*Phleum pratense*), Kentucky Blue Grass and Smooth Brome Grass (*Bromus inermis*), several goldenrods (*Solidago altissima* and *S. canadensis*) also occur widely. Shrubs such as Staghorn Sumac (*Rhus typhina*) and Silky Dogwood

(*Cornus amomum*) are scattered throughout or form small pockets. In those fields exhibiting later stages of succession, trees have become established giving the appearance of a savanna. Trees growing in these areas include hawthorns, Sugar Maple, White Ash, White Pine, White Elm and Black Walnut. Red Cedar (*Juniperus virginiana*) is common on the slopes.

Old orchards and vineyards occur in the study area and these are now old field communities.

The soils are silty clays and the moisture regime is dry to dry mesic.

6(b). Grasses - Pine/Spruce

Several areas of old field have been planted with various species such as White and/or Red Pine, White Spruce (*Picea glauca*), Black Walnut, Silver Maple (*Acer saccharinum*), White Ash, Green Ash and Eastern White Cedar (*Thuja occidentalis*). The trees are less than 8 m in height. The ground cover is typical of old fields, with Orchard Grass, Kentucky Blue Grass and Smooth Brome Grass predominating.

A summary of species planted is provided in OMNR (1989).

Soils are dry to dry-mesic silty clays and the microclimate is normal.

CULTIVATED FIELD

7. Cultivated

Fields currently under cultivation are evident throughout the Park, particularly at the eastern edge.

Soils are dry to dry-mesic silty clays and the microclimate is normal.

CHAPTER III PLANNING CONSIDERATIONS

(i) SIGNIFICANT FEATURES

(a) Significant Flora

Short Hills Provincial Park provides habitat for at least six provincially rare species of vascular plants (Argus *et al.*, 1982-87). These are White Wood Aster, Tulip Tree, American Chestnut, Pawpaw, Burning Bush, and Green Violet.

White Wood Aster is "one of the rarest [asters] in the province" (Semple and Heard, 1987, p.26), occurring in "mesic to dry deciduous woods" along the Niagara Escarpment (Semple and Chmielewski, 1983). Within Short Hills Provincial Park, it is found in two locations in upland Sugar Maple forest (Map 2).

Tulip Tree is restricted to the Carolinian life zone and in Ontario occurs on "mesic, well-drained sandy loams" (Kavanagh *et al.*, 1987). It grows in three locations in the Park, two areas in upland Sugar Maple - American Beech forest and one in a ravine.

Two large trees of American Chestnut occur in Short Hills, both of which have been marked by MNR as seed sources. This is also a Carolinian species, occurring on "moist to well-drained forests on sand, occasionally on heavy soils" (Ambrose, 1987). The status of the species in Canada is listed as 'threatened', as determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Ambrose and Aboud, 1986).

Pawpaw was reported from the Park by Walshe (1970). This species is associated with "moist woods and stream banks" (Keddy, 1984). It was not observed during this study.

Walshe (1970) also reported Burning Bush from the Park. It grows in "dry to moist thickets and woods" (Keddy, 1984). It was not observed in the Park in 1988.

An additional provincially rare plant species, Green Violet, was found in the Park by Beechey and Macdonald (1971). It was recorded from the Dry Falls ANSI (see Map 2) and although looked for in 1988, was not found.

Honey Locust (*Gleditsia tricanthos*), a provincially rare plant species, also occurs in the Park but it is obviously planted. Native populations of Trumpet Creeper (*Campsis radicans*) are also considered to be rare in Ontario, restricted to the extreme southwest portion of the province (Keddy, 1984). It commonly persists after planting, such as at Short Hills.

Determination of regionally significant plant taxa was made by reviewing literature on the flora of the Niagara Region (Yaki, 1970; Zander and Pierce, 1979) and the adjacent Regional Municipality of Haldimand-Norfolk (Sutherland, 1987). Don Sutherland is knowledgeable on the flora of the Regional Municipality of Niagara and was able to provide insights regarding the status of plants in the region. In general, those species that appear to occur in five or fewer locations within the Regional Municipality of Niagara were considered to be regionally rare.

Seven species, including the provincially rare White Wood Aster, Pawpaw, Burning Bush and Green Violet, were considered to be rare or very uncommon within Niagara Region. These species are outlined in Table 2 and their locations within the Park are shown on Map 2. Narrow-leaved Spleenwort is associated with rich slope forests of Sugar Maple - American Beech and Sugar Maple - American Beech - Eastern Hemlock. Hay-scented Fern was found on a hydro line at the edge of a Sugar Maple - American Beech forest. Hairy Wild-rye (*Elymus villosus*) was situated in a floodplain forest of Black Walnut.

(b) Significant Fauna

Fifty-two species of birds were considered to breed in the Park based on 1988 field work. Additional work would undoubtedly add more species to this list. An

TABLE 2 SIGNIFICANT PLANTS OF SHORT HILLS PROVINCIAL PARK

SPECIES

COMMON NAME

Provincially Rare

<i>Asimina triloba</i> ^a	Pawpaw
<i>Aster divaricatus</i>	White Wood Aster
<i>Castanea dentata</i>	American Chestnut
<i>Euonymus atropurpureus</i> ^a	Burning Bush
<i>Hybanthus concolor</i> ^b	Green Violet
<i>Liriodendron tulipifera</i>	Tulip Tree

Regionally Rare ¹

<i>Asimina triloba</i> ^a	Pawpaw
<i>Aster divaricatus</i>	White Wood Aster
<i>Athyrium pycnocarpon</i>	Narrow-leaved Spleenwort
<i>Dennstaedtia punctilobula</i>	Hay-scented Fern
<i>Elymus villosus</i>	Wild Hairy-rye
<i>Euonymus atropurpureus</i> ^a	Burning Bush
<i>Hybanthus concolor</i> ^b	Green Violet

1 Defined as rare or very uncommon in the Regional Municipality of Niagara.

a Reported by Walshe (1970).

b Reported by Beechey and Macdonald (1971).

analysis of the *Atlas of the Breeding Birds of Ontario* (Cadman *et al.*, 1987) suggests that four of these species can be considered to be rare or uncommon breeding birds within the Regional Municipality of Niagara. This was defined as a species occurring in five or fewer squares in this area. These are Pileated Woodpecker (*Dryocopus pileatus*), Cliff Swallow (*Hirundo pyrrhonota*), Blue-winged Warbler (*Vermivora pinus*) and Purple Finch (*Carpodacus purpureus*).

The preferred habitat of the Pileated Woodpecker is a large tract of mature forest (Dance, 1987).

Cliff Swallows are associated with man-made structures and, at Short Hills Provincial Park, several individuals were observed by D.M. Fraser at a bridge across Twelve Mile Creek. It was absent from the Niagara Peninsula during the 1981-85 survey period for the breeding bird atlas although it formerly occurred there (Taylor, 1987). This species does tend to recolonize areas from which it has been absent (*ibid.*).

The Blue-winged Warbler requires openings such as are associated with woodlands, stream edges, willow swamps and old field with shrubby growth (Mills, 1987). It is a species which seems to be increasing in numbers and expanding its breeding range in Ontario (*ibid.*).

The atlas records of Purple Finch from the Niagara Peninsula are primarily from the shores of Lakes Ontario and Erie and the Niagara River Gorge (Middleton, 1987). Its preferred nesting habitat is coniferous forest, although it will utilize open woodlands such as orchards (Godfrey, 1986).

An immature Sharp-shinned Hawk (*Accipiter striatus*) was seen at the edge of ravine next to a plantation of White Spruce and White Pine on August 31, 1988. This individual may have been a migrant, although it exhibited agitated behaviour and was found in its preferred habitat (Peck and James, 1983; Weir, 1987). Its status as a breeding species in Short Hills is therefore uncertain. Only two locations of probable breeding of this species in the Niagara Peninsula were documented in the *Atlas of the Breeding Birds of Ontario* (Weir, 1987).

Beechey and Macdonald (1971) recorded Loggerhead Shrike (*Lanius ludovicianus*) and what were thought to be Henslow's Sparrows (*Ammodramus henslowii*) from the Park in 1971. Neither of these species was recorded from the area during the breeding bird atlas survey period (1981-1985) or this study.

Wild Turkey was reintroduced to the Park in the winter of 1986 (Fraser, 1988). The sources of the original 34 birds which were released were Vermont and New York State. The current Wild Turkey population in the Park is estimated at 300 birds (pers. comm., G. Birch to J. Riley, 1988).

No significant mammals, reptiles, amphibians or butterflies were recorded.

(c) Significant Features

There are few areas within Short Hills Provincial Park that are relatively undisturbed. Approximately 50% of the land base of the Park consists of plant communities that are of anthropogenic origin. The remaining 50% represents the area covered by native vegetation. Many of these latter areas are quite disturbed, either as the result of uncontrolled pedestrian and vehicular access into them or by the introduction of weedy species that are out-competing and replacing the native flora.

Several areas in the Park were identified as being significant during the course of this study. These are outlined on Map 2. All anthropogenic communities (community types 4, 5, 6 and 7) were excluded, as were the young successional stands of Trembling Aspen (community type 2b) and Large-toothed Aspen (community type 2c). Enclaves of significant areas of native vegetation were excluded, as they are surrounded by anthropogenic vegetation types. There are many areas of successional Sugar Maple forest in the Park. Such stands were included in the significant area designation where they were situated adjacent to native forest stands and if they were relatively undisturbed.

The significance of these areas was determined using the criteria outlined in the Revised Report Format (OMNR, 1976). The significance of selected areas of Short Hills Provincial Park is summarized in Table 3.

Representative value was determined by evaluating the area in relation to the vegetation associations found in the Niagara Section of the Niagara Escarpment Planning Area as outlined in Cuddy *et al.* (1976). Degree of disturbance was also used to assess representativeness.

Scientific value was assessed by evaluating the area in terms of its potential for conducting scientific research into the functioning of an ecosystem, community, population or individual.

Interpretive and educational value was determined by evaluating the area in terms of the degree to which it provides an example of an ecological process or relationship representative of the region or province.

The presence of significant species (floral and faunal) and unique associations was used to determine significant habitat/features.

Overall significance was determined by evaluating the area on a local, regional, and provincial scale.

Constraints to development for the significant areas of Short Hills Provincial Park were determined using the Revised Report Format (OMNR, 1976). The sensitivity of the entire Park has been discussed and mapped by Davidson (1974). In general, the upland plateaus are least sensitive to disturbance, while the slopes are prone to slumping and the valley bottoms are subject to erosion.

Areas of high water table, seepage, and organic soils were identified as having extreme constraints to development.

Table 3: Significance of Selected Areas in Short Hills Provincial Park
(refer to Map 2)

	Representative Value	Scientific Value	Interpretive/ Educational Value	Significant Habitat/ Features	No. of Provincially Rare Species	No. of Regionally Rare Species	Total No. of Rare Species	Overall Significance
E1	C	C	B	C				L
E2	A	B	B	A	1	1	2	R
H1	A	A	B	A	3	1	4	R (P?)
H2	C	C	C	B	2		2	L
H3	A	A	A	A	2	2	2	R (P?)
H4	A	A	A	B				R (P?)

Legend:
A - very high
B - high
C - moderate
P - provincial
R - regional
L - local

Those significant areas located along the floodplains of the various watercourses in the Park were identified as having high sensitivity. This is due to the presence of a high water table and erodible soils. Additional areas located along valley slopes or on tableland were also classified as having high sensitivity due to steep slopes and erodible soils.

(E1) Marsh (community type 1)

The areas of marsh within the Park are typical of those found in this portion of the province. However, there are larger examples of marsh vegetation at Fifteen Mile Creek ANSI (Cuddy *et al.*, 1976). Within Short Hills Provincial Park, the marsh community adds to the overall diversity of habitats.

(E2) Mixed Forest (community type 2)

The forest of the slopes and bottom of the Twelve Mile Creek valley are representative of those occurring in the Niagara Section of the Niagara Escarpment Planning Area. This forest type is also represented at the Fonthill Sandhill Valleys ANSI (Cuddy *et al.*, 1976).

In Short Hills Provincial Park, this rich, relatively mature forest type provides habitat for the provincially rare Tulip Tree and the regionally rare Narrow-leaved Spleenwort.

(H1) Sugar Maple (community type 2a, in part)

The upland forests of Short Hills Provincial Park differ in their species composition, maturity and degree of disturbance. The relatively undisturbed stands of Sugar Maple are representative of those found in this portion of the province. The presence of species such as Tulip Tree and American Chestnut illustrates the affinity of these forests to the Carolinian zone.

Significant species found in this community type include White Wood Aster, American Chestnut, Tulip Tree and Pileated Woodpecker.

(H2) Sugar Maple (community type 2a, in part)

These areas are either successional or are quite disturbed. In many spots, introduced weeds such as Wild Garlic Mustard, dominate the understory.

(H3) Black Walnut (community type 2e)

Forests dominated by Black Walnut are restricted to the Carolinian region of Ontario. There are several such stands situated throughout Short Hills Provincial Park. The degree of disturbance found in similar Black Walnut stands in the Niagara Section of the Niagara Escarpment Planning Area is unknown. Accordingly, the existence of this community type in the Park may be of provincial significance.

This community type provides habitat for two provincially and regionally rare plant species, Pawpaw and Burning Bush.

(H4) Black Maple (community type 2f)

The rich stands of Black Maple occurring in Short Hills Provincial Park are representative of those found on floodplains or river bottoms in southern Ontario. The distribution of such stands in the Niagara Section of the Niagara Escarpment Planning Area is unknown and therefore, those at Short Hills may be of provincial significance.

(ii) EVALUATION OF THE LIFE SCIENCE AREAS OF NATURAL AND SCIENTIFIC INTEREST IN SHORT HILLS PROVINCIAL PARK

An evaluation of potential ANSIs representing features of the Niagara Escarpment was conducted in 1976 (Cuddy *et al.*, 1976). The criteria used to evaluate these sites were: representation, diversity, condition, special features (uniqueness and

rare species) and ecological considerations (size, homogeneity, buffering capacity). These criteria were applied to the life science ANSIs (candidate Nature Reserve Zones) within Short Hills Provincial Park. Areas outside of the Park boundaries, such as at DeCew Falls and the Short Hills Wilderness Area of the Hamilton Naturalists' Club, have a number of significant features (see Beechey and Macdonald, 1971; Hamilton Naturalists' Club, 1982). They were not evaluated during this study.

1. Representation - Dry Falls Valley ANSI was chosen to represent the vegetation associated with the re-entrant valley of the Short Hills Kame (Macdonald, 1976a). Twelve Mile Creek Valley represents the vegetation of the dendritic valley of the Short Hills Dissected Kame (Macdonald, 1976b). The vegetation of Terrace Creek is representative of the re-entrant valley of the dissected kame.
2. Diversity - Three plant communities were recognized within Dry Falls Valley ANSI, one associated with the upland, and two with the slopes and valley bottoms. Seven communities were distinguished in the Twelve Mile Creek Valley; only four however, are examples of native forest. This latter ANSI provides a good example of Sugar Maple forest with Eastern Hemlock, but lacks the other forest community types associated with valley bottoms (Black Walnut) and lower slopes (Black Maple). These latter two forest types are represented in the Dry Falls Valley ANSI. Two vegetation community types are represented at Terrace Creek, Sugar Maple forest and old field.

Three hundred and nine species of vascular plants were recorded from the Park (Appendix A) during the present study, several of which are restricted to the Carolinian life zone of Ontario.

3. Condition - Trails are found throughout the Park, including those portions containing the two life science ANSIs (Map 3). This has resulted in problems such as erosion in some places. This is due mainly to removal of vegetation on the slopes. Several slumps were noted (Map 3). Overuse of the trails has resulted in moderate to severe rutting, gullyng or soil compaction throughout the upland, slopes and valley bottoms.

An alien species, Garlic Mustard, dominates the understory in certain areas, especially along the dry creek bed near Dry Falls. It is crowding out the native understory vegetation.

The forests have been selectively logged or grazed in the past.

A large part of the Twelve Mile Creek Valley is composed of either old field or pine plantation. It also contains areas in which Garlic Mustard dominates the understory of the relatively mature forest.

In contrast, the degree of disturbance at Terrace Creek is minimal, with limited trail development and few alien plant species.

4. Ecological Considerations - The two life science ANSIs within Short Hills Provincial Park are surrounded by lands that are either under cultivation or in old field. A pipeline forms the southern boundary of Dry Falls Valley ANSI and a hydro line delineates the north edge of Twelve Mile Creek Valley ANSI. Terrace Creek is surrounded by upland forest, old field and cultivated field.

Both ANSIs are small in size.

5. Special Features - The special features of Short Hills Provincial Park have been outlined in a Chapter III of this report.

Two provincially rare plants, White Wood Aster and Tulip Tree, occur in Twelve Mile Creek Valley ANSI. This ANSI also supports populations of the regionally rare Narrow-leaved Spleenwort and Blue-winged Warbler. There were no significant features associated with Dry Falls Valley ANSI as determined by this study, although it is the location of Green Violet as described by Beechey and Macdonald (1971).

Terrace Creek provides habitat for the provincially rare American Chestnut.

(iii) CONCLUSIONS

Short Hills Provincial Park contains 16 community types, eight of which fall within the major categories of native marsh or forest. Approximately 50 percent of the Park consists of old or cultivated fields or plantations. The remnant woodlots are interspersed with old field, plantations or areas currently under cultivation. Alien species are common in the understory of many of the woodlots. In addition, there is a complex system of trails throughout the entire area. Transmission corridors and pipelines criss-cross the Park.

A total of 309 species of vascular plants was recorded from the Park during the present study (Appendix A). This includes three provincially rare and four regionally rare species. Four regionally significant birds occur in the Park.

(iv) MANAGEMENT CONSIDERATIONS

The following management considerations for Short Hills Provincial Park are based on this biological inventory.

1. Consideration should be given to dropping the life science ANSI designation from the Dry Falls site in favour of the significant area at Terrace Creek (Map 2). (It would retain its current earth science designation as the Dry Falls Valleys). The life science features for which Dry Falls was originally chosen are also represented at Terrace Creek except that the floodplain forests of Black Walnut found at Dry Falls are absent at Terrace Creek. The Terrace Creek site is in better condition, and the Garlic Mustard is not located there.
2. The designation of life science nature reserve zone should apply to the revised life science Areas of Natural and Scientific Interest.

3. Those significant areas that are not ANSIs should be zoned as Natural Environment and managed in a way that ensures maintenance of their special features.
4. Consideration should be given to examining areas outside of Short Hills Provincial Park for representation of life science features in this portion of the Site District. Specifically, areas at DeCew Falls and the Short Hills Wilderness Area of the Hamilton Naturalists' Club should be examined.
5. Trail systems throughout the Park should be rationalized as to use, and maintained (Map 3). Compaction, erosion, removal of native vegetation and the subsequent invasion of weedy species has been and will continue to be a problem unless management of the trails is initiated. Trails in the candidate life science Nature Reserve Zones should be minimized, closely monitored, or phased out if soil erosion or noxious weeds are occurring along them.

ATV and horse trails create serious erosion problems (Map 3) and future use of these trails by ATVs and horses should be excluded from sensitive areas, especially lowlands and streams. Closing and alteration of trail use to allow trail regeneration should be considered, especially in the Dry Falls Valley lowlands.

6. Detailed inventories of fauna and spring flora were not undertaken during this study, and more information on their status within the Park may be desirable. Site inspections should be made prior to construction of facilities or development of trails.
7. Populations of significant plants and/or animals may need to be monitored periodically to assess their status. This is especially true of those populations occurring in close proximity to trails.
8. Consideration should be given to the management and control of weedy species, especially Garlic Mustard. Displacement of native understory vegetation is occurring as a result of the invasion of such weeds.

9. Periodic inspections of the significant areas within the Park should be undertaken to assess the condition of these areas.
10. Consideration should be given to assisting in the regeneration of some field areas adjacent to hardwood forests, if species native to the park are used, and if the composition of the plantings is relatively similar to that of the adjacent forest stand. Records of the provenance of such stock must be kept, including the origins of the seed used for the nursery stock (preferably Niagara Peninsula seed sources).

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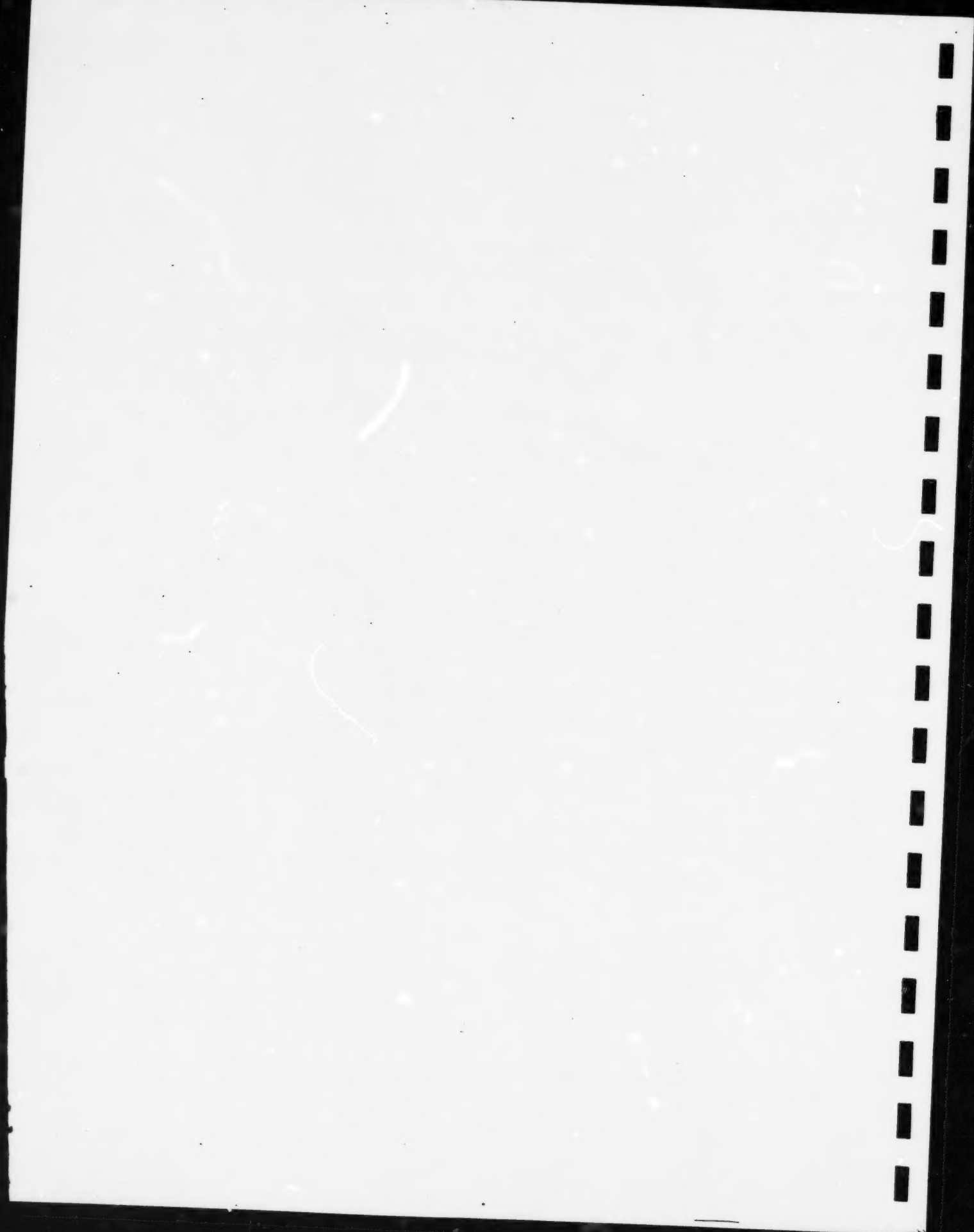
Canada Department of Energy, Mines and Resources, Surveys and Mapping Branch.
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Ontario Ministry of Natural Resources, Airphoto Library. 1978. 1:10 000.

Flight Line:

4306 63:451-453

4307 208: 64-65



APPENDIX A: VASCULAR PLANTS OF SHORT HILLS PROVINCIAL PARK

A total of 309 species of vascular plants was recorded from Short Hills Provincial Park during the course of this investigation. All observations are those of the author. Observations of Beechey and Macdonald (1971) have not been included as their study area was larger than the Park, and there was no indication of whether the plants were observed in or outside of Park boundaries.

An annotation of + indicates an introduced or adventive species. The symbol (+) indicates a species that may be native in one part of its range, introduced in another.

Collections are indicated by an asterisk (*) and these have been deposited in the herbarium at the University of Toronto (TRT) unless otherwise indicated. Taxonomy follows that outlined in Riley (1988).

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
EQUISETACEAE	HORSETAIL FAMILY	
<i>Equisetum arvense</i> L.	Field Horsetail	2e, f
<i>Equisetum fluviatile</i> L.	Water Horsetail	2a
DENNSTAEDTIACEAE	BRACKEN FAMILY	
<i>Dennstaedtia punctilobula</i> (Michx.) Moore	Hay-scented Fern	2a
ADIANTACEAE	MAIDENHAIR FERN FAMILY	
<i>Adiantum pedatum</i> L.	Northern Maidenhair Fern	2a, f
ASPLENIACEAE	SPLEENWORT FAMILY	
<i>Athyrium filix-femina</i> (L.) Roth var. <i>michauxii</i> (Spreng.) Fern.	Northeastern Lady Fern	2a
* <i>Athyrium pycnocarpon</i> (Spreng.) Tidestr.	Narrow-leaved Spleenwort	3
* <i>Athyrium thelypteroides</i> (Michx.) Desv.	Silvery Glade Fern	2a
<i>Cystopteris bulbifera</i> (L.) Bernh.	Bulbet Fern	2a, f
<i>Cystopteris tenuis</i> (Michx.) Desv.	Mackay's Fragile Fern	3
<i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs	Spinulose Wood Fern	2a
<i>Dryopteris cristata</i> (L.) Gray	Crested Wood Fern	2a, f
<i>Dryopteris intermedia</i> (Willd.)	Glandular Wood Fern	2a, 3
<i>Dryopteris marginalis</i> (L.) Gray	Marginal Wood Fern	2a, 3
<i>Onoclea sensibilis</i> L.	Sensitive Fern	1
<i>Polystichum acrostichoides</i> (Michx.) Schott	Christmas Fern	2a
THELYPTERIDACEAE	BEECH FERN FAMILY	
<i>Thelypteris palustris</i> (Salisb.) Schott	Marsh Fern	2e

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
PINACEAE	PINE FAMILY	
+ <i>Picea abies</i> (L.) Karst.	Norway Spruce	6b
+ <i>Picea glauca</i> (Moench) Voss	White Spruce	5c, 6a
<i>Pinus strobus</i> L.	White Pine	2a, 5a, b, c 6a, b
+ <i>Pinus resinosa</i> Ait.	Red Pine	5b
<i>Tsuga canadensis</i> (L.) Carr.	Eastern Hemlock	2a, f, 3
CUPRESSACEAE	CYPRESS FAMILY	
<i>Juniperus communis</i> L.	Common Juniper	6a
var. <i>depressa</i> Pursh		
<i>Juniperus virginiana</i> L.	Red Cedar	6a
<i>Thuja occidentalis</i> L.	White Cedar	2a
TYPHACEAE	CATTAIL FAMILY	
<i>Typha angustifolia</i> L.	Narrow-leaved Cattail	1
<i>Typha latifolia</i> L.	Common Cattail	1
ALISMATACEAE	WATER-PLANTAIN FAMILY	
<i>Alisma plantago-aquatica</i> L.	Water-plantain	1, 2e
<i>Sagittaria latifolia</i> Willd.	Arrowhead	2e
POACEAE	GRASS FAMILY	
+ <i>Agropyron repens</i> (L.)	Quack Grass	6a
* <i>Bromus ciliatus</i> L.	Fringed Brome Grass	2a
+ <i>Bromus inermis</i> Leyss.	Smooth Brome Grass	6a
+ <i>Bromus mollis</i> L.	Soft Chess	6a
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	Canada Blue-joint	6a
<i>Cinna latifolia</i> (Goepp.) Griseb.	Nodding Wood Grass	2e
+ <i>Dactylis glomerata</i> L.	Orchard Grass	6a, b
+ <i>Echinochloa crusgalli</i> (L.) Beauv.	Barnyard Grass	6a
<i>Elymus hystrix</i> L.	Bottle-brush Grass	2a, f
<i>Elymus riparius</i> Wieg.	River Bank Wild-rye	2e
<i>Elymus villosus</i> Willd.	Hairy Wild-rye	2e, 6a
+ <i>Festuca arundinacea</i> Schreb.	Tall Fescue	6a
<i>Glyceria borealis</i> (Nash) Batch.	Northern Manna Grass	1
<i>Glyceria striata</i> (Lam.) A.S. Hitche.	Fowl Manna Grass	2a, e, f
<i>Oryzopsis asperifolia</i> Michx.	Rough-leaved Mountain-rice	2a
<i>Panicum lanuginosum</i> Ell. var. <i>implicatum</i> (Scribn.) Fern.	Panic Grass	6a
+ <i>Phleum pratense</i> L.	Timothy	2d, 6a
(+) <i>Poa compressa</i> L.	Canada Blue Grass	6a, b

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
+ <i>Poa pratensis</i> L.	Kentucky Blue Grass	2e, 6a
+ <i>Setaria viridis</i> (L.) Beauv.	Green Foxtail	6a
CYPERACEAE	SEDGE FAMILY	
<i>Carex blanda</i> Dew.	Sedge	2a
<i>Carex convoluta</i> Mack.	Sedge	2a
<i>Carex cristatella</i> Britt.	Sedge	1
<i>Carex gracillima</i> Schw.	Sedge	3
<i>Carex granularis</i> Muhl. ex Willd.	Sedge	6a
* <i>Carex hystericina</i> Muhl. ex Willd.	Sedge	1
<i>Carex laxiflora</i> Lam.	Sedge	2a
* <i>Carex lupulina</i> Muhl. ex Willd.	Sedge	1
<i>Carex lurida</i> Wahl.	Sedge	1
<i>Carex pensylvanica</i> Lam.	Sedge	2a
<i>Carex platyphylla</i> Carey	Sedge	2a, f
<i>Carex rosea</i> Schk. ex Willd.	Sedge	2a
<i>Carex stipata</i> Muhl. ex Willd.	Sedge	1
* <i>Carex vulpinoidea</i> Michx.	Sedge	6a
<i>Eleocharis obtusa</i> (Willd.) Schult.	Spike-rush	2e
<i>Scirpus atrovirens</i> Willd.	Black Bulrush	1
ARACEAE	ARUM FAMILY	
<i>Arisaema triphyllum</i> (L.) Schott	Jack-in-the-pulpit	2a, e, f
<i>Calla palustris</i> L.	Water-arum	1
<i>Symplocarpus foetidus</i> (L.) Nutt.	Skunk Cabbage	2a
LEMNACEAE	DUCKWEED FAMILY	
<i>Lemna minor</i> L.	Common Duckweed	1
JUNCACEAE	RUSH FAMILY	
<i>Juncus bufonius</i> L.	Toad Rush	1, 2e
<i>Juncus dudleyi</i> Wieg.	Rush	2e
* <i>Juncus effusus</i> L.	Rush	1
<i>Juncus tenuis</i> Willd.	Path Rush	2e, 6a

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
LILIACEAE	LILY FAMILY	
<i>Allium canadense</i> L.	Wild Garlic	2a, f
<i>Allium tricoccum</i> Ait.	Wild Leek; Ramps	2a
<i>Asparagus officinalis</i> L.	Garden Asparagus	2e, 6a
<i>Lilium michiganense</i> Farw.	Canada Lily	2a
<i>Maianthemum canadense</i> Desf.	Wild-lily-of-the-Valley	2a, f
<i>Polygonatum pubescens</i> (Willd.) Pursh	Solomon's-seal	2a, f
<i>Smilacina racemosa</i> (L.) Desf.	False Solomon's-seal	2a, e, f
<i>Smilacina stellata</i> (L.) Desf.	False Solomon's-seal	2a
<i>Smilax herbacea</i> L.	Carrión-flower	2e
<i>Trillium grandiflorum</i> (Michx.) Salisb.	White Trillium	2a
<i>Uvularia grandiflora</i> Sm.	Bellwort	2f
ORCHIDACEAE	ORCHID FAMILY	
+ <i>Epipactis helleborine</i> (L.) Crantz	Helleborine	2a, 5c
SALICACEAE	WILLOW FAMILY	
<i>Populus grandidentata</i> Michx.	Large-toothed Aspen	2a, c, f
<i>Populus tremuloides</i> Michx.	Trembling Aspen	2a, b
+ <i>Salix alba</i> L.	White Willow	2e
+ <i>Salix fragilis</i> L.	Crack Willow	2e
JUGLANDACEAE	WALNUT FAMILY	
<i>Carya cordiformis</i> (Wang.) K. Koch	Bitternut Hickory	2a, e
<i>Carya ovata</i> (Mill.) K. Koch	Shagbark Hickory	2a, e, 4
<i>Juglans cinerea</i> L.	Butternut	2a, d
+ <i>Juglans nigra</i> L.	Black Walnut	2a, e, 5b
BETULACEAE	BIRCH FAMILY	
<i>Betula alleghaniensis</i> Britt.	Yellow Birch	2a, f, 3
<i>Betula papyrifera</i> Marsh.	White Birch	2a, e, f
<i>Carpinus caroliniana</i> Walt.	Blue Beech; Hornbeam	2a, f
<i>Ostrya virginiana</i> (Mill.) K. Koch K. Koch	Hop Hornbeam; Ironwood	2a, c, f

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
FAGACEAE	BEECH FAMILY	
<i>Castanea dentata</i> (Marsh.) Borkh.	American Chestnut	2f
<i>Fagus grandifolia</i> Ehrh.	Beech	2a, 3
<i>Quercus alba</i> L.	White Oak	2a, e
<i>Quercus macrocarpa</i> Michx.	Bur Oak	1
<i>Quercus rubra</i> L.	Red Oak	2a
<i>Quercus velutina</i> Lam.	Black Oak	2a
ULMACEAE	ELM FAMILY	
<i>Ulmus americana</i> L.	White Elm	2a, e, 6a
MORACEAE	MULBERRY FAMILY	
+ <i>*Maclura pomifera</i> (Raf.) Schneid.	Osage Orange	6a
URTICACEAE	NETTLE FAMILY	
<i>Laportea canadensis</i> (L.) Wedd.	Wood Nettle	2e
<i>Pilea pumila</i> (L.) Gray	Richweed, Clearweed	2e
<i>Urtica dioica</i> L. subsp. <i>gracilis</i> (Ait.)	American Stinging Nettle	2f
ARISTOLOCHIACEAE	BIRTHWORT FAMILY	
<i>Asarum canadense</i> L.	Wild Ginger	2a, e, f
POLYGONACEAE	BUCKWHEAT FAMILY	
<i>Polygonum aviculare</i> L.	Prostrate Knotweed	6a
+ <i>Polygonum persicaria</i> L.	Lady's Thumb	6a
<i>Polygonum virginianum</i> L.	Jumpseed	2a, e, f
+ <i>Rumex acetosella</i> L.	Sheep Sorrel	6a
+ <i>Rumex crispus</i> L.	Curly Dock	6a
PHYTOLACCACEAE	POKEWEED FAMILY	
<i>*Phytolacca americana</i> L.	Pokeweed	6a
CARYOPHYLLACEAE	PINK FAMILY	
+ <i>Cerastium fontanum</i> Baumg.	Mouse-eared Chickweed	6a

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
RANUNCULACEAE		
<i>Actaea pachypoda</i> Ell.	White Baneberry	2a, f
<i>Anemone canadensis</i> L.	Canada Anemone	6a
<i>Clematis virginiana</i> L.	Virgin's-bower	2e
<i>Hepatica acutiloba</i> DC. Fern.	Sharp-lobed Hepatica	2a, f
<i>Ranunculus abortivus</i> L.	Small-flowered Buttercup	2a
+ <i>Ranunculus acris</i> L.	Tall Buttercup	2e, 6a
<i>Ranunculus sceleratus</i> L.	Cursed Crowfoot	2f
<i>Thalictrum dioicum</i> L.	Early Meadow Rue	2a, f
BERBERIDACEAE	BARBERRY FAMILY	
+ <i>Berberis vulgaris</i> L.	Common Barberry	6a
<i>Caulophyllum thalictroides</i> (L.) Michx.	Blue Cohosh	2a, e, f
* <i>Jeffersonia diphylla</i> L.	Twinleaf	2a, f
<i>Podophyllum peltatum</i> L.	May-apple	2a
MENISPERMACEAE	MOONSEED FAMILY	
<i>Menispermum canadense</i> L.	Moonseed	2e
MAGNOLIACEAE	MAGNOLIA FAMILY	
<i>Liriodendron tulipifera</i> L.	Tulip Tree	2a
LAURACEAE	LAUREL FAMILY	
<i>Lindera benzoin</i> (L.) Blume	Spicebush	2a, e
<i>Sassafras albidum</i> L.	Sassafras	2a
PAPAVERACEAE	POPPY FAMILY	
+ <i>Chelidonium majus</i> L.	Celandine	2a, e
<i>Sanguinaria canadensis</i> L.	Bloodroot	2a, f
BRASSICACEAE	MUSTARD FAMILY	
+ <i>Alliaria petiolata</i> (Bieb.) Cavara & Grande	Garlic Mustard	2a, d, e, f, 4, 5b
+ <i>Arabis laevigata</i> (Muhl.) Poir.	Smooth Rock Cress	2a
<i>Dentaria diphylla</i> Michx.	Toothwort	2a
+ <i>Hesperis matronalis</i> L.	Dame's-rocket	2e
SAXIFRAGACEAE		

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
<i>Mitella diphylla</i> L.	Bishop's Cap	2a
GROSSULARIACEAE	GOOSEBERRY FAMILY	
<i>Ribes cynosbati</i> L.	Prickly Gooseberry	2a, e
<i>Ribes triste</i> Pall.	Swamp Red Currant	2e
HAMAMELIDACEAE	WITCH-HAZEL FAMILY	
<i>Hamamelis virginiana</i> L.	Witch-hazel	2a, f
ROSACEAE	ROSE FAMILY	
<i>Agrimonia gryposepala</i> Wallr.	Agrimony	5b, 6a
<i>Amelanchier arborea</i> (Michx. f.) Fern.	Juneberry, Serviceberry	2a
<i>Crataegus</i> sp.	Hawthorn	4, 6a
<i>Fragaria vesca</i> L.	Woodland Strawberry	2a, 5b
<i>Fragaria virginiana</i> Dcne.	Common Strawberry	6a
<i>Geum canadense</i> Jacq.	White Avens	2e, f, 5b, 6a, b
<i>Geum</i> cf. <i>laciniatum</i> Murr.	Avens	2a, 6a
+ <i>Malus domestica</i> Borkh.	Apple	2e, 4
<i>Physocarpus opulifolius</i> (L.) Maxim.	Ninebark	6a
+ <i>Potentilla recta</i> L.	Rough-fruited Cinquefoil	6a
<i>Potentilla simplex</i> Michx.	Common or Old-field Cinquefoil	5b, 6a
<i>Prunus americana</i> Marsh.	Wild Plum	2a
<i>Prunus nigra</i> Ait.	Canada Plum	2a, f
<i>Prunus serotina</i> Ehrh.	Black Cherry	2a, f, 3
<i>Prunus virginiana</i> L.	Chokecherry	2a
+ <i>Pyrus communis</i> L.	Pear	6a
+ <i>Rosa multiflora</i> Thumb.	Multiflora, Japanese Rose	2d, 6a
<i>Rubus allegheniensis</i> Porter	Common Blackberry	2a, d, e, 5b, 6a
<i>Rubus occidentalis</i> L.	Black Raspberry	6a
<i>Rubus odoratus</i> L.	Flowering Raspberry	2a, 6a
<i>Rubus strigosus</i> Michx.	Wild Red Raspberry	2e, 6a
+ <i>Sorbus aucuparia</i> L.	European Mountain-ash	2e
<i>Spiraea alba</i> DuRoi	Meadowsweet	6a
FABACEAE	PEA FAMILY	
<i>Amphicarpaea bracteata</i> (L.) Fern.	Hog-peanut	2a, e, f
<i>Apios americana</i> Medic.	Groundnut	2a
<i>Desmodium glutinosum</i> (Muhl.) Wood	Tick-trefoil	2a
<i>Desmodium nudiflorum</i> (L.) DC.	Tick-trefoil	2e
+ <i>Gleditsia triacanthos</i> L.	Honey Locust	6a
+ <i>Medicago lupulina</i> L.	Black Medic	6a
+ <i>Medicago sativa</i> L.	Alfalfa	6a

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
+ <i>Melilotus alba</i> Medic.	White Sweet-clover	6a
+ <i>Melilotus officinalis</i> (L.) Pall.	Yellow Sweet-clover	6a
+ <i>Trifolium pratense</i> L.	Red Clover	6a
+ <i>Trifolium repens</i> L.	White Clover	6a
+ <i>Vicia cracca</i> L.	Bird Vetch	1, 6a, b
+ * <i>Vicia tetrasperma</i> (L.) Schreb.	Sparrow Vetch	6a
GERANIACEAE	GERANIUM FAMILY	
<i>Geranium maculatum</i> L.	Wild or Spotted Cranesbill	2a
+ <i>Geranium robertianum</i> L.	Herb Robert	2a, e, f
OXALIDACEAE	WOOD-SORREL FAMILY	
<i>Oxalis fontana</i> Bunge	Wood-sorrel	2a
EUPHORBIACEAE	SPURGE FAMILY	
<i>Euphorbia esula</i> L.	Leafy Spurge	2e
ANACARDIACEAE	CASHEW FAMILY	
<i>Rhus radicans</i> L.	Poison-ivy	2a, e
<i>Rhus typhina</i> L.	Staghorn Sumac	2d, 6a
CELASTRACEAE	STAFF-TREE FAMILY	
<i>Celastrus scandens</i> L.	Climbing Bittersweet	2a
<i>Euonymus obovatus</i> Nutt.	Running Strawberry-bush	2a, e
ACERACEAE	MAPLE FAMILY	
<i>Acer negundo</i> L.	Manitoba Maple	2e, 6a
<i>Acer nigrum</i> Michx. f.	Black Maple	2a, e, f
<i>Acer saccharum</i> Marsh.	Sugar Maple	2a, b, e, f, 3, 6a
BALSAMINACEAE	TOUCH-ME-NOT-FAMILY	
<i>Impatiens capensis</i> Meerb.	Spotted Jewelweed, Touch-me-not	2a, e, f
RHAMNACEAE	BUCKTHORN FAMILY	
<i>Rhamnus alnifolia</i> L'Herr	Alder-leaved Buckthorn	2a
+ <i>Rhamnus cathartica</i> L.	Common Buckthorn	6a
VITACEAE	GRAPE FAMILY	
<i>Parthenocissus inserta</i> (A. Kerner) Fritsch	Virginia Creeper	2a, e, 5b, 6a

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
<i>Vitis riparia</i> Michx.	Riverbank Grape	2f, 6a
<i>Vitis aestivalis</i> Michx.	Summer Grape	2e
+ <i>Vitis labrusca</i> L.	Fox Grape	6a
TILIACEAE	LINDEN FAMILY	
<i>Tilia americana</i> L.	Basswood	2a, e, f, 3
HYPERICACEAE	ST. JOHN'S-WORT FAMILY	
+ <i>Hypericum perforatum</i> L.	Common St. John's-wort	2a, f, 6a
<i>Triadenum fraseri</i> (Spach) Gl.	Marsh St. John's-wort	1
VIOLACEAE	VIOLET FAMILY	
<i>Viola pubescens</i> Ait.	Downy Yellow Violet	2a
LYTHRACEAE	LOOSESTRIFE FAMILY	
+ <i>Lythrum salicaria</i> L.	Purple Loosestrife	1
ONAGRACEAE	EVENING-PRIMROSE FAMILY	
<i>Circaea alpina</i> L.	Small Enchanter's Nightshade	2a
<i>Circaea lutetiana</i> L.	Enchanter's Nightshade	2a, e, 5b
<i>Epilobium ciliatum</i> Raf.	Sticky Willowherb	1
<i>Oenothera parviflora</i> L.	Small-flowerer Evening-primrose	6a
<i>Oenothera perennis</i> L.	Meadow Sundrops	6a
APIACEAE	CARROT FAMILY	
<i>Cryptotaenia canadensis</i> (L.) DC.	Honewort	2a, 2f
+ <i>Daucus carota</i> L.	Wild Carrot, Queen Anne's Lace	2e, 6a
<i>Sanicula marilandica</i> L.	Black Snakeroot	2f
<i>Sium suave</i> Walt.	Water-parsnip	1
<i>Taenidia integerrima</i> (L.) Drude	Yellow Pimpernel	2e
CORNACEAE	DOGWOOD FAMILY	
<i>Cornus alternifolia</i> L. f.	Alternate-leaved Dogwood	2a, 6a
<i>Cornus amomum</i> Mill.	Silky Dogwood	2e
<i>Cornus florida</i> L.	Flowering Dogwood	2e, 5b
<i>Cornus foemina</i> Mill.	Grey Dogwood	2a, 6a
<i>Cornus rugosa</i> Lam.	Round-leaved Dogwood	6a
<i>Cornus stolonifera</i> Michx.	Red-osier Dogwood	6a
PRIMULACEAE	PRIMROSE FAMILY	
<i>Lysimachia nummularia</i> L.	Moneywort	1, 2e, f

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
OLEACEAE	OLIVE FAMILY	
<i>Fraxinus americana</i> L.	White Ash	2a, b, c, e, f, 3, 4, 5b, c,
<i>Fraxinus pennsylvanica</i> Marsh.	Red Ash	2e, f, 6a
+ <i>Syringa vulgaris</i> L.	Common Lilac	2d, e, 6a
APOCYNACEAE	DOGBANE FAMILY	
<i>Apocynum androsaemifolium</i> L.	Spreading Dogbane	2f
ASCLEPIADACEAE	MILKWEED FAMILY	
<i>Asclepias syriaca</i> L.	Common Milkweed	6a, b
CONVOLVULACEAE	MORNING GLORY FAMILY	
<i>Calystegia sepium</i> (L.) R.Br.	Hedge Bindweed, Wild Morning Glory	2f
+ <i>Convolvulus arvensis</i> L.	Field Bindweed	6a
HYDROPHYLLACEAE	WATERLEAF FAMILY	
<i>Hydrophyllum canadense</i> L.	Canada Waterleaf	2f
<i>Hydrophyllum virginianum</i> L.	Virginia Waterleaf	2a
BORAGINACEAE	BORAGE FAMILY	
+ <i>Myosotis scorpioides</i> L.	True Forget-me-not	1
VERBENACEAE	VERVAIN FAMILY	
<i>Verbena hastata</i> L.	Blue Vervain	1
<i>Verbena urticifolia</i> L.	White Vervain	2a, e
LAMIACEAE	MINT FAMILY	
<i>Collinsonia canadensis</i> L.	Richweed Horsebalm	2a
+ <i>Glechoma hederacea</i> L.	Ground-ivy	6a
+ <i>Leonurus cardiaca</i> L.	Motherwort	2a
<i>Lycopus americanus</i> Muhl.	American Water-horehound	1
<i>Monarda fistulosa</i> L.	Wild Bergamot	6a
<i>Prunella vulgaris</i> L.	Heal-all	6a
<i>Scutellaria galericulata</i> L.	Common Skullcap	1
* <i>Teucrium canadense</i> L.	Woodsage	2e

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
SOLANACEAE	NIGHTSHADE FAMILY	
<i>Physalis heterophylla</i> Nees	Clammy Ground-cherry	2e, 6a
+ <i>Solanum dulcamara</i> L.	Bitterweet	1
SCROPHULARIACEAE	FIGWORT FAMILY	
<i>Melampyrum lineare</i> Desr.	Cow-wheat	2a
<i>Pedicularis canadensis</i> L.	Wood-betony, Common Lousewort	2e
* <i>Penstemon digitalis</i> Nutt.	Beard-tongue	6a
<i>Scrophularia marilandica</i> L.	Carpenter's Square	2a
+ <i>Veronica officinalis</i> L.	Common Speedwell	2a
BIGNONIACEAE	BIGNONIA FAMILY	
+ <i>Catalpa bignonioides</i> Watt.	Common Catalpa	6a
+ * <i>Campsis radicans</i> (L.) Seem.	Trumpet Creeper	6a
OROBANCHACEAE	BROOM-RAPE FAMILY	
<i>Epifagus virginiana</i> (L.) Bart.	Beech-drops	2a
PHRYMACEAE	LOPSEED FAMILY	
<i>Phryma leptostachya</i> L.	Lopseed	2a
PLANTAGINACEAE	PLANTAIN FAMILY	
+ <i>Plantago lanceolata</i> L.	English Plantain	6a
+ <i>Plantago major</i> L.	Broad-leaved Plantain	6a
<i>Plantago rugelii</i> Dcne.	Rugel's Plantain	6a
RUBIACEAE	MADDER FAMILY	
<i>Galium aparine</i> L.	Cleavers	2e
<i>Galium circaeans</i> Michx.	Wild Licorice	2a, 6a
<i>Galium triflorum</i> Michx.	Sweet-scented Bedstraw	2a, 6a
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY	
<i>Lonicera dioica</i> L.	Wild Honeysuckle	2e
+ <i>Lonicera tatarica</i> L.	Tartarian Honeysuckle	6a
<i>Sambucus canadensis</i> L.	Common Elder	1, 6a
<i>Sambucus pubens</i> Michx.	Red-berried Elder	2a
<i>Symphoricarpos albus</i> (L.) Blake	Snowberry	2a
<i>Triosteum aurantiacum</i> Bickn.	Wild Coffee	2a, e, 6a
<i>Viburnum acerifolium</i> L.	Maple-leaved Viburnum	2a, b, e, f, 6a
<i>Viburnum trilobum</i> Marsh.	Highbush-cranberry	6a
DIPSACACEAE	TEASEL FAMILY	
+ <i>Dipsacus fullonum</i> L.	Teasel	6a

FAMILY SPECIES	COMMON NAME	COMMUNITY NUMBER
CUCURBITACEAE	GOURD FAMILY	
Echinocystis lobata (Michx.) T. & G.	Wild Cucumber	2e
CAMPANULACEAE	BLUEBELL OR HAREBELL FAMILY	
+ Campanula rapunculoides L.	Creeping Bellflower	6a
LOBELIACEAE	LOBELIA FAMILY	
*Lobelia inflata L.	Indian Tobacco	6a
Lobelia siphilitica L.	Great Lobelia	2f
ASTERACEAE	ASTER FAMILY	
Achillea millefolium L.	Yarrow	2a, 6a
Ambrosia artemisiifolia L.	Common Ragweed	2a, f, 6a
Ambrosia trifida L.	Giant Ragweed	6a
Antennaria neglecta Greene	Pussytoes	2a
+ Arctium minus (Hill) Bernh.	Common Burdock	2a, d
*Aster divaricatus L. ¹	White Wood Aster	2a
Aster lanceolatus Willd	Tall White Aster	6a
Aster macrophyllus L.	Large-leaved Aster	2a
Aster novae-angliae L.	New England Aster	6a
Aster pilosus Willd.	Aster	6a
Aster puniceus L.	Red-stemmed Aster	2e, 6a
Bidens frondosa L.	Devil's Beggarticks	1
Bidens vulgata Greene	Tall Beggarticks	1
+ *Centaurea jacea L.	Knapweed	6a
+ Chrysanthemum leucanthemum L.	Ox-eye Daisy	6a
+ Cichorium intybus L.	Chickory	6a
+ Cirsium arvense (L.) Scop.	Canada Thistle	6a
+ Cirsium vulgare (Savi) Tenore	Bull Thistle	6a
Erechtites hieraciifolia (L.) Raf.	American Burnweed, Fireweed	2e, 6a
Erigeron annuus (L.) Pers.	Annual Fleabane	6a
Eupatorium maculatum L.	Spotted Joe-Pye Weed	1, 2e
Eupatorium perfoliatum L.	Boneset	1, 2e, 6a
Eupatorium rugosum Houtt.	White Snakeroot	2a
+ Hieracium piloselloides Vill.	King Devil Hawkweed	2e
+ *Hieracium vulgatum (Fries) Almquist	Common Hawkweed	6a
+ Inula helenium L.	Elecampane	2e
Lactuca biennis (Moench) Fern.	Tall Blue Lettuce	2e
Lactuca serriola L.	Prickly Lettuce	6a
Prenanthes sp.	White Lettuce	2a
+ Rudbeckia triloba L.	Brown-eyed Susan	6a
Solidago altissima L.	Tall Goldenrod	2e, 6a
Solidago caesia L.	Blue-stem Goldenrod	2a, f
Solidago canadensis L.	Canada Goldenrod	6a
Solidago flexicaulis L.	Zig-zag Goldenrod	2a
Solidago graminifolia (L.) Salisb.	Narrow-leaf Goldenrod	6a
+ Taraxacum officinale Weber	Dandelion	6a
+ Tragopogon dubius Scop.	Goat's-beard	6a

¹ Identification confirmed by Dr. J. Semple, University of Waterloo. Specimen housed at that institution (WAT)

APPENDIX B : BIRDS OF SHORT HILLS PROVINCIAL PARK

Fifty-five species of birds were observed in Short Hills Provincial Park during the field season; of these, fifty-two are considered to breed on site. The breeding status follows that outlined for the Atlas of the Breeding Birds of Ontario (Cadman et al. 1987). All observations are those of J. Gould and/or D. Fraser.

COMMON NAME	SCIENTIFIC NAME	OBSERVED	BREEDING EVIDENCE		
			POSSIBLE	PROBABLE	CONFIRMED
Turkey Vulture	<i>Cathartes aura</i>	X			
Northern Harrier	<i>Circus cyaneus</i>		SH		
Sharp-shinned Hawk	<i>Accipiter striatus</i>	X (M?)			
Red-tailed Hawk	<i>Buteo jamaicensis</i>		SH		
Ruffed Grouse	<i>Bonasa umbellus</i>				FY
Wild Turkey*	<i>Meleagris gallopavo</i>		SH		
Rock Dove	<i>Columba livia</i>		SH		
Mourning Dove	<i>Zenaidura macroura</i>			T	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>		SM		
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>			T	
Belted Kingfisher	<i>Ceryle alcyon</i>		SH		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	holes			
Downy Woodpecker	<i>Picoides pubescens</i>			A	
Hairy Woodpecker	<i>Picoides villosus</i>				FY
Northern Flicker	<i>Colaptes auratus</i>			T	
Pileated Woodpecker	<i>Dryocopus pileatus</i>		SH		
Eastern Wood-Pewee	<i>Contopus virens</i>			T	
Least Flycatcher	<i>Empidonax minimus</i>		SM		
Eastern Phoebe	<i>Sayornis phoebe</i>				FS
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		SM		
Eastern Kingbird	<i>Tyrannus tyrannus</i>			A	
Tree Swallow	<i>Tachycineta bicolor</i>		SH		
Cliff Swallow	<i>Hirundo pyrrhonota</i>		SH		
Barn Swallow	<i>Hirundo rustica</i>		SH		
Blue Jay	<i>Cyanocitta cristata</i>			T	
American Crow	<i>Corvus brachyrhynchos</i>			T	
Black-capped Chickadee	<i>Parus atricapillus</i>				FY
White-breasted Nuthatch	<i>Sitta carolinensis</i>			T	
House Wren	<i>Troglodytes aedon</i>				FY
Wood Thrush	<i>Hylocichla mustelina</i>			T	
American Robin	<i>Turdus migratorius</i>				FY
Gray Catbird	<i>Dumetella carolinensis</i>			A	
Cedar Waxwing	<i>Bombycilla cedrorum</i>		SM		
European Starling	<i>Sturnus vulgaris</i>		SH		
Red-eyed Vireo	<i>Vireo olivaceus</i>			T	
Blue-winged Warbler	<i>Vermivora pinus</i>				FY
Yellow Warbler	<i>Dendroica petechia</i>				FY
American Redstart	<i>Setophaga ruticilla</i>		SM		
Ovenbird	<i>Seiurus aurocapillus</i>		SM		

APPENDIX B: BIRDS OF SHORT HILLS PROVINCIAL PARK

COMMON NAME	SCIENTIFIC NAME	OBSERVED	BREEDING EVIDENCE		
			POSSIBLE	PROBABLE	CONFIRMED
Common Yellowthroat	<i>Geothlypis trichas</i>			T	
Northern Cardinal	<i>Cardinalis cardinalis</i>				FY
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			A	
Indigo Bunting	<i>Passerina cyanea</i>			A	
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>			T	
Chipping Sparrow	<i>Spizella passerina</i>				FS
Field Sparrow	<i>Spizella pusilla</i>			T	
Song Sparrow	<i>Melospiza melodia</i>				FS
Red-winged Blackbird	<i>Agelaius phoeniceus</i>				FS
Eastern Meadowlark	<i>Sturnella magna</i>		SM		
Common Grackle	<i>Quiscalus quiscula</i>			T	
Brown-headed Cowbird	<i>Molothrus ater</i>		SH		
Northern Oriole	<i>Icterus galbula</i>			A	
Purple Finch	<i>Carpodacus purpureus</i>		SH		
House Finch	<i>Carpodacus mexicanus</i>		SM		
American Goldfinch	<i>Carduelis tristis</i>			T	

NOTES: The codes used for breeding evidence correspond to those outlined in the Atlas of the Breeding Birds of Ontario (Cadman et al. 1987).

▪ Released bird, OMNR 1986

A Agitated behaviour

FS Adult carrying faecal sac or food for young

FY Recently fledged young or downy young

SH Species seen in suitable nesting habitat

SM Single male or breeding calls heard

T Registration of territorial behaviour

X Species observed in breeding season

X(M?) Species observed; possibly refers to a migrant individual

APPENDIX C: MAMMALS, REPTILES AND AMPHIBIANS OF SHORT HILLS PROVINCIAL PARK

The following list of mammals and herpetofauna recorded from Short Hills Provincial Park consists of incidental observations by J. Gould and/or D. Fraser. This list does not represent a complete inventory of these groups.

COMMON NAME	SCIENTIFIC NAME	EVIDENCE
<u>MAMMALS</u>		
Raccoon (female and 4 yg)	<i>Procyon lotor</i>	Observed
Striped Skunk	<i>Mephitis mephitis</i>	Odour
Eastern Coyote	<i>Canis latrans</i>	Observed
Eastern Chipmunk	<i>Tamias striatus</i>	Observed
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	Observed
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Observed
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Observed
White-tailed Deer	<i>Odocoileus virginianus</i>	Observed
<u>REPTILES</u>		
Common Garter Snake	<i>Thamnophis sirtalis</i>	Observed
Brown Snake	<i>Storeria dekayi</i>	Observed
<u>AMPHIBIANS</u>		
Red-backed Salamander	<i>Plethodon cinereus</i>	Observed
American Toad	<i>Bufo americanus</i>	Observed
Wood Frog	<i>Rana sylvatica</i>	Observed
Green Frog	<i>Rana clamitans</i>	Observed

APPENDIX D: BUTTERFLIES OF SHORT HILLS PROVINCIAL PARK

The following list of butterflies recorded from Short Hills Provincial Park consists of incidental observations by D. Fraser. in 1982 and 1988. Records from 1982 are reported in Hess (1982). This list is not a complete inventory of Lepidoptera of the Park.

COMMON NAME	SCIENTIFIC NAME	YEAR OF OBSERVATION
European Cabbage Butterfly	<i>Artogeia rapae</i>	1988
European Skipper	<i>Thymelicus lineola</i>	1982, 1988
Hobomok Skipper	<i>Poanes hobomok</i>	1988
Long Dash Skipper	<i>Polites mystic</i>	1982
Northern Broken Dash	<i>Wallengrenia egeremet</i>	1982
Little Glassywing	<i>Pompeius verna</i>	1988
Least Skipper	<i>Ancyloxpha numitor</i>	1988
Two-spotted Skipper	<i>Euphyes bimacula</i>	1982
Tiger Swallowtail	<i>Pterourus glaucus</i>	1982
Question Mark	<i>Polygonia interrogationis</i>	1988
Hickory Hairstreak	<i>Satyrium caryaevorum</i>	1982
Spring Azure	<i>Celastrina ladon</i>	1982
Great Spangled Fritillary	<i>Speyeria cybele</i>	1982
Baltimore	<i>Euphydryas phaeton</i>	1982, 1988
Wood Nymph	<i>Cercyonis pegala</i>	1988
Banded Purple	<i>Basilarchia a. arthemis</i>	1982
Pearly Eye	<i>Anthedon portlandica</i>	1988
Eyed Brown	<i>Satyrodes eurydice</i>	1988

APPENDIX E: SLIDE DESCRIPTIONS

The following list of slides are those taken by the author during the course of this study.

1. Sugar Maple-American Beech-Red Oak forest along creek Valley - July 12, 1988
2. Stand of Sugar Maple with Red Oak, White Oak west of Cataract Road - June 28, 1988
3. Sugar Maple-American Beech-Red Oak forest showing much *Alliaria petiolata* in understory - June 28, 1988
4. Stand of Sugar Maple-White Ash with *Alliaria* in understory - June 29, 1988
5. Ridge with Sugar Maple-American Beech - July 13, 1988
6. Sugar Maple-American Beech forest along ravine in Hemlock Valley - June 29, 1988
7. Young Sugar Maple-American Beech forest - July 12, 1988
8. Young forest of Sugar Maple - June 28, 1988
9. East facing slope of Twelve Mile Creek with Black Walnut - June 29, 1988
10. Stand of Black Walnut on Terrace - June 27, 1988
11. Floodplain forest with Black Walnut, Green Ash, White Elm - July 13, 1988
12. Bottomland forest of Black Maple with Blue Beech, Hop-hornbeam, White Ash - June 27, 1988
13. Edge of Creek above Dry Falls with Black Walnut - June 28, 1988
14. Twelve Mile Creek - July 13, 1988
15. Dry Creek with *Impatiens capensis*, *Alliaria* - June 27, 1988
16. Limestone of Dry Creek; Black Maple in valley bottom - June 27, 1988
17. Dry creek bed - June 28, 1988
18. View of old field in late succession - July 13, 1988
19. View to east from old vineyard north of Boy Scout Camp - July 13, 1988
20. *Jeffersonia diphylla* in Sugar Maple-American Beech stand - June 28, 1988
21. *Jeffersonia diphylla* (close-up) - June 28, 1988
22. Hydrolline at south end of Park - June 27, 1988

APPENDIX F: GENERAL INFORMATION SHEET - SHORT HILLS PROVINCIAL PARK

Inventory of Areas of Natural and Scientific Interest (ANSI)

The ANSI program of the Ministry of Natural Resources has identified life science and earth science features and sites which best represent the vegetation and landform features of Ontario. Criteria such as representation, diversity, condition and special features are used to evaluate a site prior to its inclusion into the program. Inventories of these areas have also been initiated to further identify the significant features within the sites, and re-evaluate the boundaries of these sites.

Significance of the ANSIs in Short Hills Provincial Park

There are relatively few traces of native forest remaining in the Niagara Peninsula. The ANSIs of Short Hills Provincial Park provide representation of the vegetation associated with the re-entrant and dendritic valleys of the Short Hills Kame (Macdonald, 1976a, 1976b). They also provide habitat for provincially and regionally rare plant and animal species such as Tulip Tree, Narrow-leaved Spleenwort and Blue-winged Warbler. Twelve Mile Creek, the only coldwater stream in Niagara District, flows through the Park.

Additional information can be obtained from:

Regional Ecologist
Parks and Recreational Areas
Ministry of Natural Resources
10670 Yonge Street
Richmond Hill, Ontario
L4C 3C9
(416) 883-3247

APPENDIX G

AREA OF NATURAL AND SCIENTIFIC INTEREST - LIFE SCIENCE INVENTORY CHECK-SHEET

NAME Dry Falls (Short Hills P. P. I)		MAP NAME Niagara		MAP NUMBER 30M/3	UTM REF. 385725
COUNTY, DISTRICT or REGIONAL MUNICIPALITY Niagara		LAT. 43° 05' N	LONG. 79° 18' W	ALT. MIN. m 105	MAX. 150
LOCALITY		1:50,000 NTS MAP SHOWING AREA BOUNDARIES			
TOWNSHIP Pelham	LOTS pt2,3	CONCESSIONS 2			
AREA 29 acres 12 ha					
OWNERSHIP Ministry of Natural Resources					
ADMINISTRATION Ministry of Natural Resources					
FOREST REGION AND DISTRICT Deciduous/Niagara	SITE REGION AND DISTRICT 7-2				
MNR REGION AND DISTRICT Central/Niagara	CONSERVATION AUTHORITY Niagara Peninsula				
AERIAL PHOTOGRAPHS					
BASE MAP: YEAR ROLL FLIGHT LINE NUMBERS					

PHYSICAL AND BIOLOGICAL FEATURES

This area was originally chosen to represent the re-entrant valley of the Short Hills dissected kame (Macdonald, 1976a). Biological features include young to intermediate aged forests of Sugar Maple- American Beech on the upland and upper slopes, Black Maple on the lower slopes and floodplain and Black Walnut-Green Ash-White Elm on the floodplains and terraces. The Niagara Escarpment is exposed along one of the valleys.

The ANSI is quite disturbed as the forests have been logged or grazed, there are several trails throughout and weedy species such as Garlic Mustard (*Alliaria petiolata*) have taken over the understory in places.

DATA SHEETS ATTACHED		SUMMARY SPECIES LISTS		MAJOR INFORMATION SOURCES	
PHYSICAL DESCRIPTION	☐	PHYSICAL FEATURES MAP	☐	Beechey and Macdonald, 1971; Macdonald, 1976a; field visits, 1988.	
VEGETATION SUMMARY	☐	VEGETATION MAP	☐		
EVALUATION SHEET	☐	BIBLIOGRAPHY	☐		
COMMUNITY DESCRS.	☐	PHOTOGRAPHS	☐		
COMMUNITY COMP. LISTS	☐				

EVALUATION AND PRIORITIES

Consideration should be given to finding another area with the same features that is in better condition.

DATE COMPILED

October, 1988

COMPILED

J. Gould

AREA OF NATURAL AND SCIENTIFIC INTEREST - LIFE SCIENCE INVENTORY CHECK-SHEET

NAME Twelve Mile Creek (Short Hills P.P.II)		MAP NAME Niagara		MAP NUMBER 30M/3 & 6	UTM REF. 395715
COUNTY, DISTRICT or REGIONAL MUNICIPALITY Niagara		LAT. 43° 05'N	LONG. 79° 16'W	ALT. MIN. m 105	MAX. 167
LOCALITY		1:50,000 NTS MAP SHOWING AREA BOUNDARIES			
TOWNSHIP Thorold	LOTS pt 109-112	CONCESSIONS 3			
AREA 161 acres 67 ha					
OWNERSHIP Ministry of Natural Resources					
ADMINISTRATION Ministry of Natural Resources					
FOREST REGION AND DISTRICT Deciduous/Niagara	SITE REGION AND DISTRICT 7-2				
MNR REGION AND DISTRICT Central/Niagara	CONSERVATION AUTHORITY Niagara Peninsula				
AERIAL PHOTOGRAPHS BASE MAP: YEAR ROLL FLIGHT LINE NUMBERS					

PHYSICAL AND BIOLOGICAL FEATURES

This ANSI was originally chosen to represent the vegetation associated with the dendritic valley of the Short Hills dissected kame (Macdonald, 1976b). The primary feature of this area is the valley of Twelve Mile Creek. The vegetation associated with this ravine system consists of Sugar Maple-American Beech forest of various ages. Eastern Hemlock is a common associate of some of the forests of the deeper ravines. A large portion of this ANSI is composed of old field and plantation.

Several significant species occur here including the provincially rare White Wood Aster (Aster divaricatus) and Tulip Tree (Liriodendron tulipifera), and regionally rare Narrow-leaved Spine-wort (Asplenium pycnocarpon).

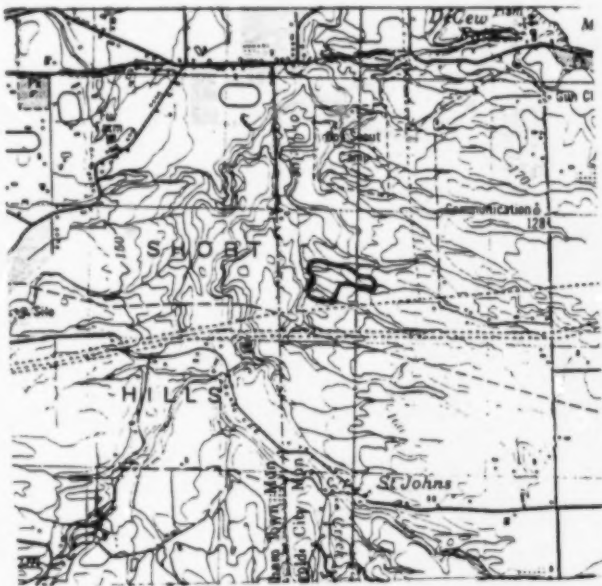
DATA SHEETS ATTACHED		SUMMARY SPECIES LISTS		MAJOR INFORMATION SOURCES	
PHYSICAL DESCRIPTION	☐	PHYSICAL FEATURES MAP	☐	Beechey and Macdonald, 1971; Macdonald, 1976b; field visits, 1988.	
VEGETATION SUMMARY	☐	VEGETATION MAP	☐		
EVALUATION SHEET	☐	BIBLIOGRAPHY	☐		
COMMUNITY DESCRS.	☐	PHOTOGRAPHS	☐		
COMMUNITY COMP. LISTS	☐				

EVALUATION AND PRIORITIES

This area should be retained as an ANSI to represent the vegetation associated with a river valley system.

DATE COMPILED October, 1988	COMPILED BY J. Gould
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AREA OF NATURAL AND SCIENTIFIC INTEREST - LIFE SCIENCE INVENTORY CHECK-SHEET

NAME Terrace Creek		MAP NAME Niagara	MAP NUMBER 30M/3	UTM REF. 395725
COUNTY, DISTRICT or REGIONAL MUNICIPALITY Niagara		LAT. 43° 06' N	LONG. 79° 17' W	ALT. MIN. MAX. m 110 145
LOCALITY		1:50,000 NTS MAP SHOWING AREA BOUNDARIES		
TOWNSHIP Thorold	LOTS pt 87-88	CONCESSIONS 4		
AREA 161 acres		67 ha		
OWNERSHIP Ministry of Natural Resources				
ADMINISTRATION Ministry of Natural Resources				
FOREST REGION AND DISTRICT Deciduous/Niagara		SITE REGION AND DISTRICT 7-2		
MNR REGION AND DISTRICT Central/Niagara		CONSERVATION AUTHORITY Niagara		
AERIAL PHOTOGRAPHS				
BASE MAP: YEAR ROLL FLIGHT LINE NUMBERS				
				

PHYSICAL AND BIOLOGICAL FEATURES

This unit consists of Sugar Maple-American Beech forest on the upland and upper slopes and Black Maple-Sugar Maple on the lower ones. These forests are of intermediate age and are in good condition. The understory of these slopes is rich, with species such as Blue Cohosh (*Caulophyllum thalictroides*), Bloodroot (*Sanguinaria canadensis*) and Twin-leaf (*Jeffersonia diphylla*) present. Exposures associated with the Niagara Escarpment are found along the creek valley.

Significant species include American Chestnut (*Castanea dentata*).

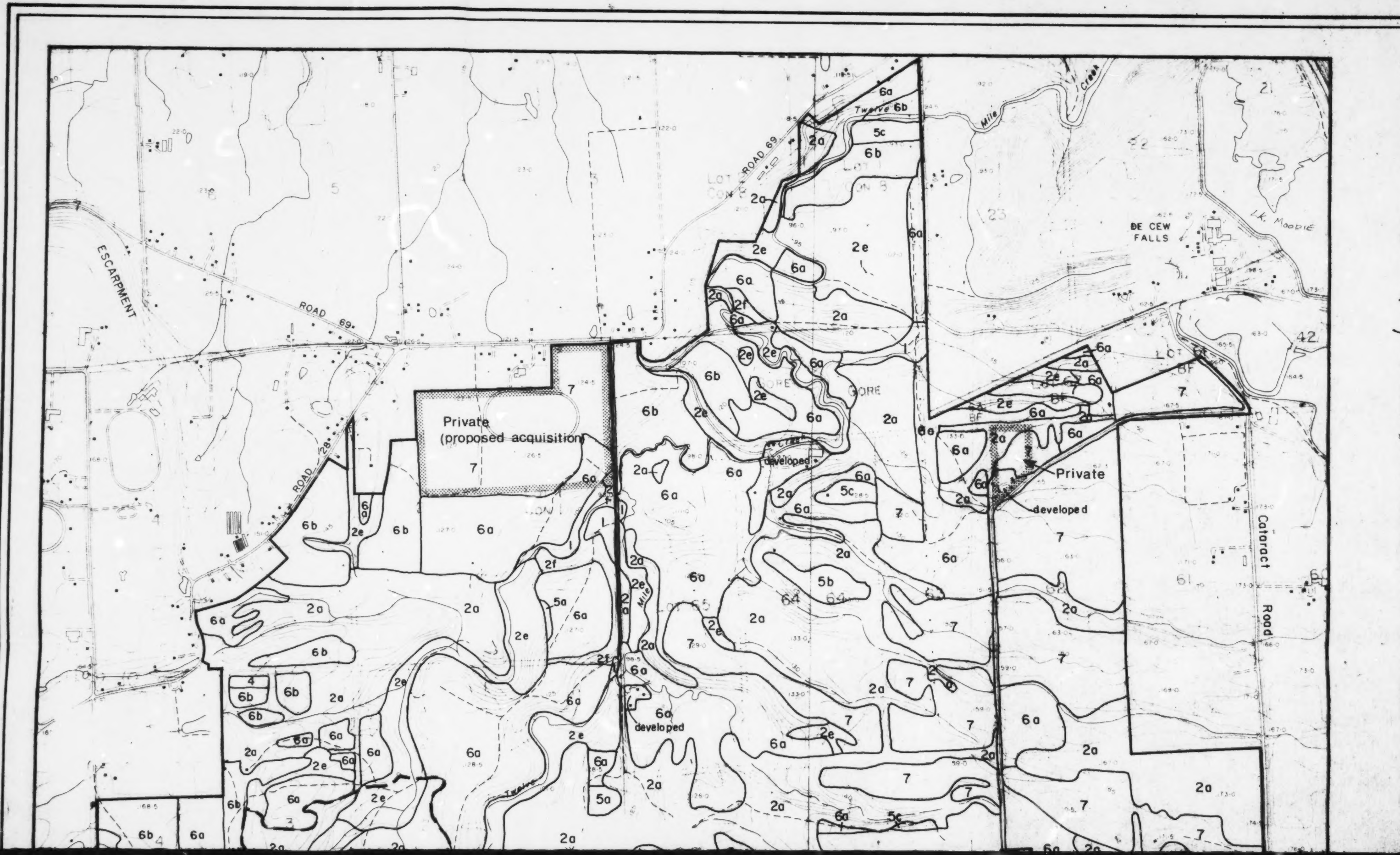
DATA SHEETS ATTACHED		SUMMARY SPECIES LISTS		MAJOR INFORMATION SOURCES
PHYSICAL DESCRIPTION	☐	PHYSICAL FEATURES MAP	☐	field visits, 1988
VEGETATION SUMMARY	☐	VEGETATION MAP	☐	
EVALUATION SHEET	☐	BIBLIOGRAPHY	☐	
COMMUNITY DESCRS.	☐	PHOTOGRAPHS	☐	
COMMUNITY COMP. LISTS	☐			

EVALUATION AND PRIORITIES

Consideration should be given to designating this area to represent the vegetation associated with the re-entrant valley of the dissected kame instead of Dry Falls.

DATE COMPILED October, 1988	COMPILED BY J. Gould
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(O.07k, P.R., 89 07 15)
ISBN 0-7729-5917-X



MAP 1

VEGETATION OF SHORT HILLS PROVINCIAL PARK

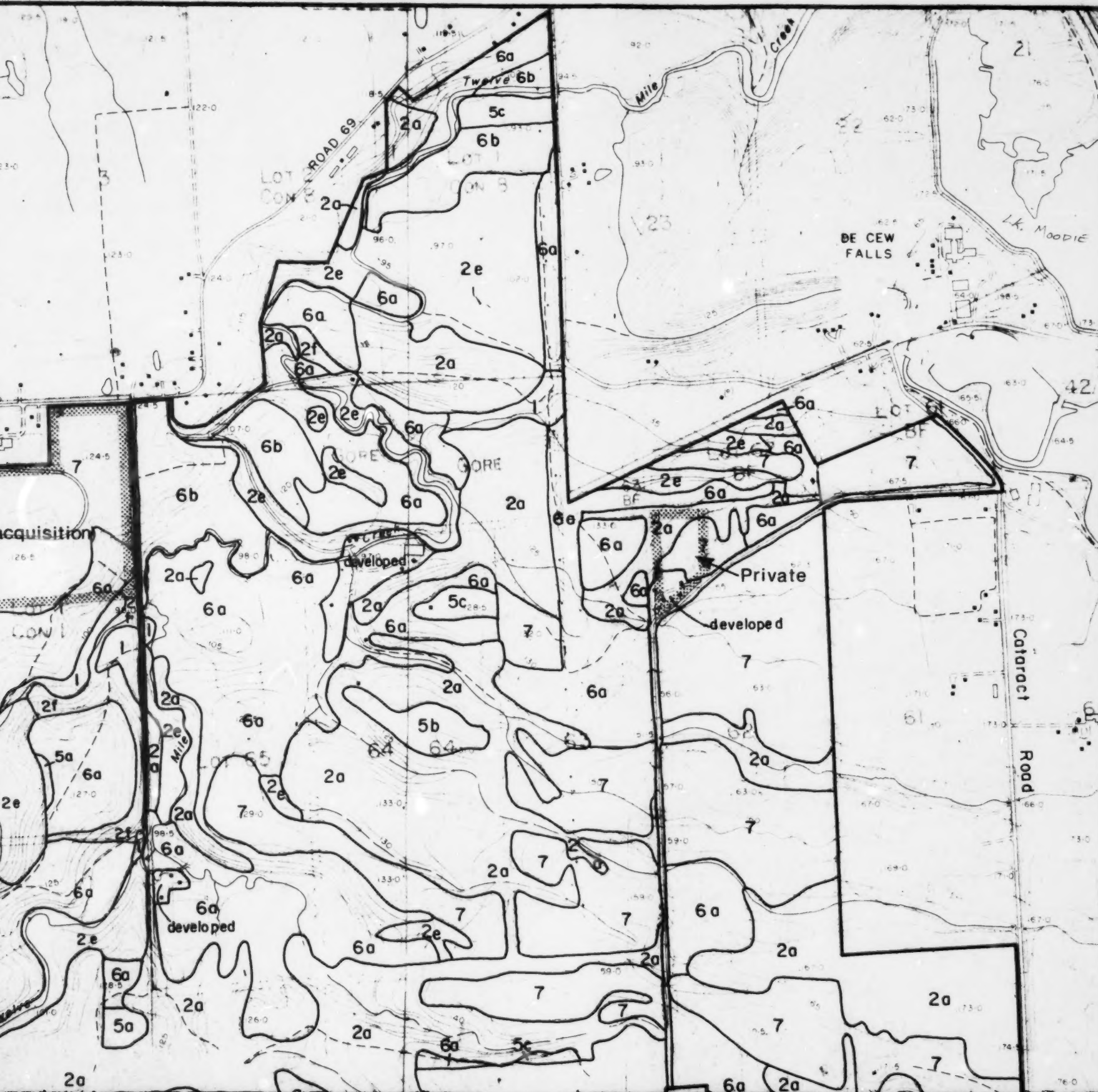
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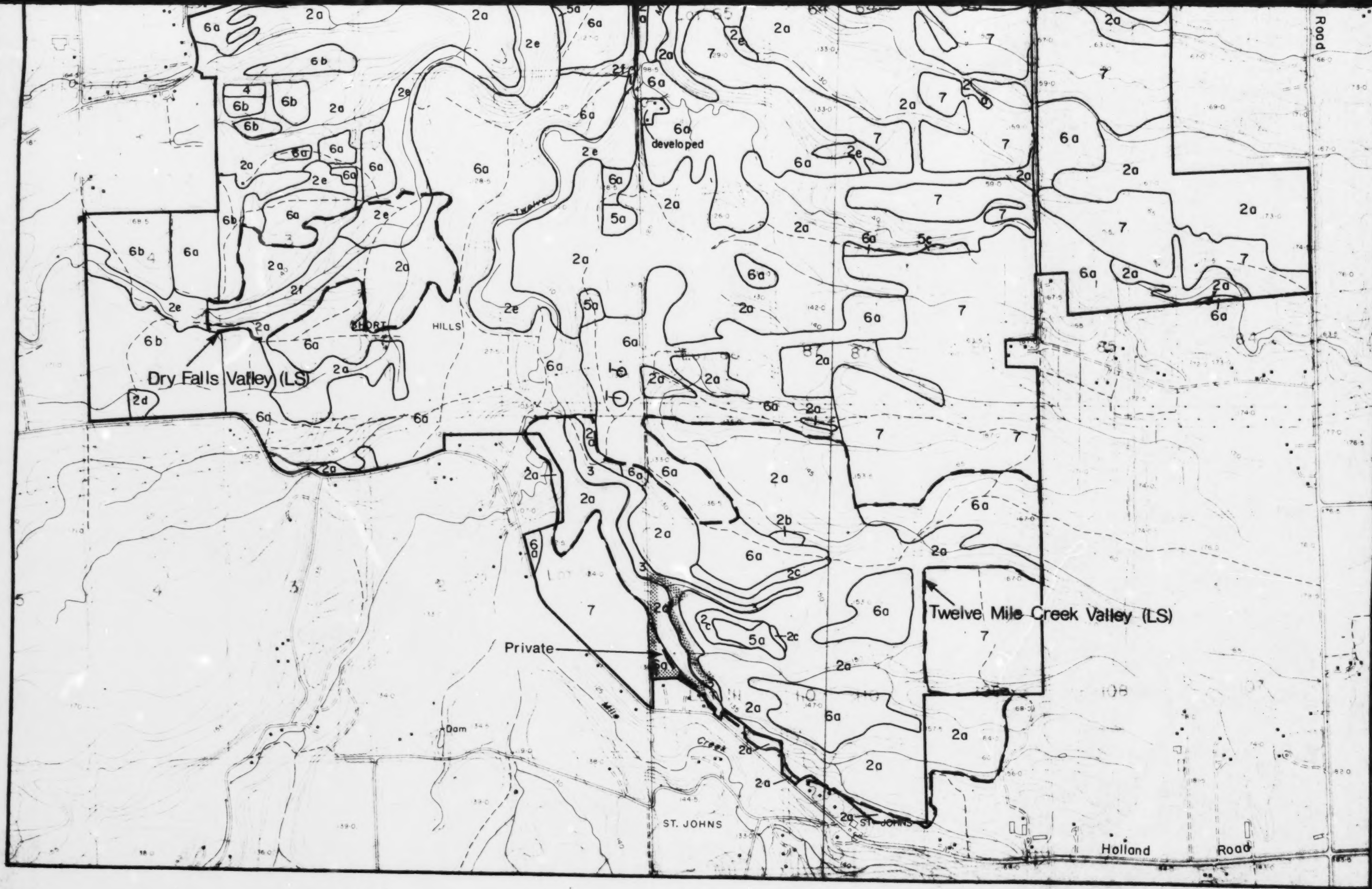
SYMBOLS

- Boundary of Short Hills Provincial Park
- Boundary of Area of Natural and Scientific Interest (life science)
- - - Ungraded Road or Trail
- ▨ Privately Owned Land

LEGEND

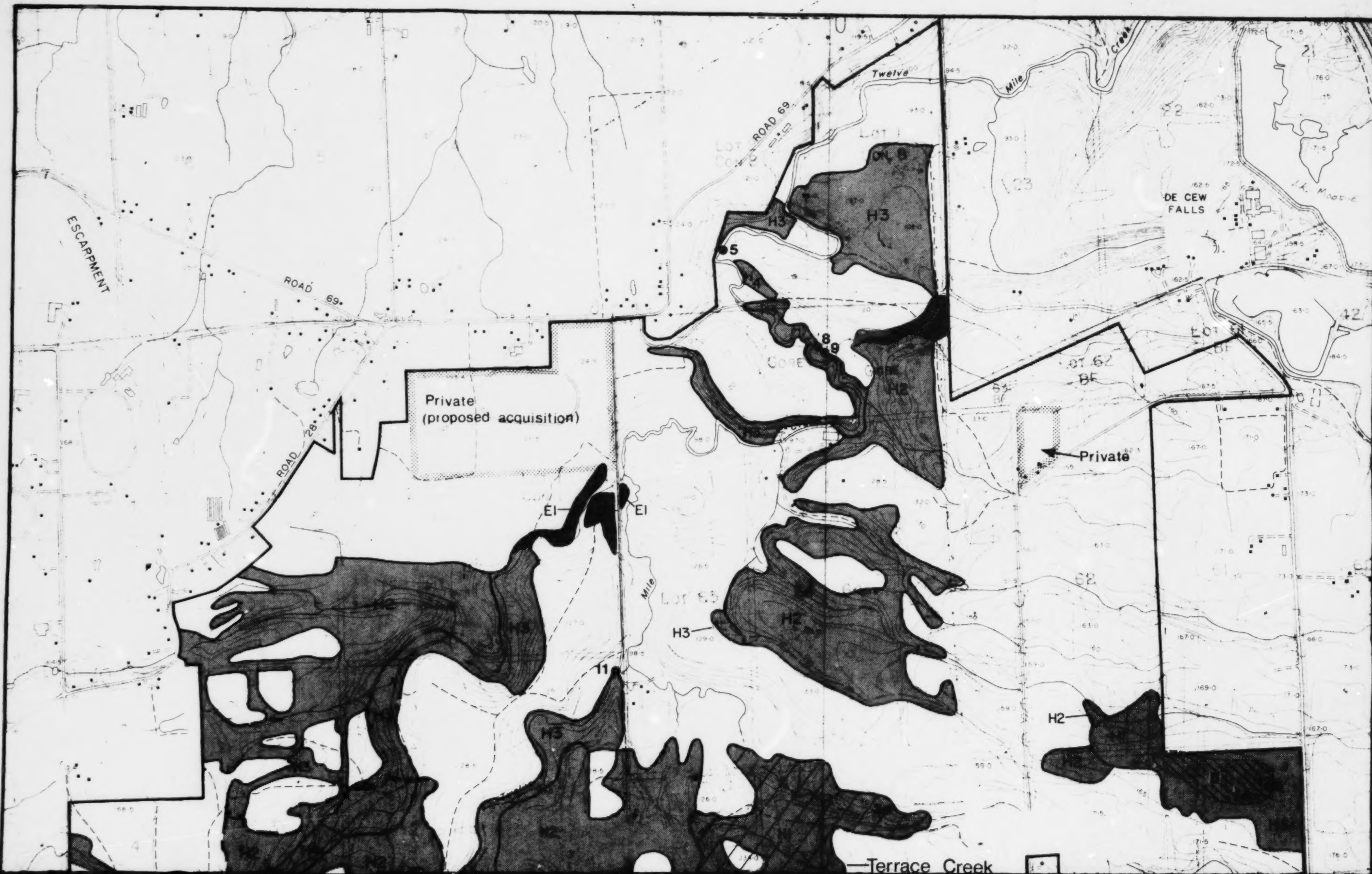
- 1 Marsh
- 2 Deciduous Forest
 - a) Sugar Maple (*Acer saccharum*)
 - b) Trembling Aspen (*Populus tremuloides*)
 - c) Large-toothed Aspen (*Populus grandidentata*)
 - d) Butternut (*Juglans cinerea*)
 - e) Black Walnut (*Juglans nigra*)
 - f) Black Maple (*Acer nigrum*)
- 3 Mixed Forest
- 4 Hawthorn Thicket
- 5





Prepared by







MAP 2

SIGNIFICANT FEATURES OF SHORT HILLS PROVINCIAL PARK

SCALE 1:10 000
Metres 100 0 200 400 Metres

SYMBOLS

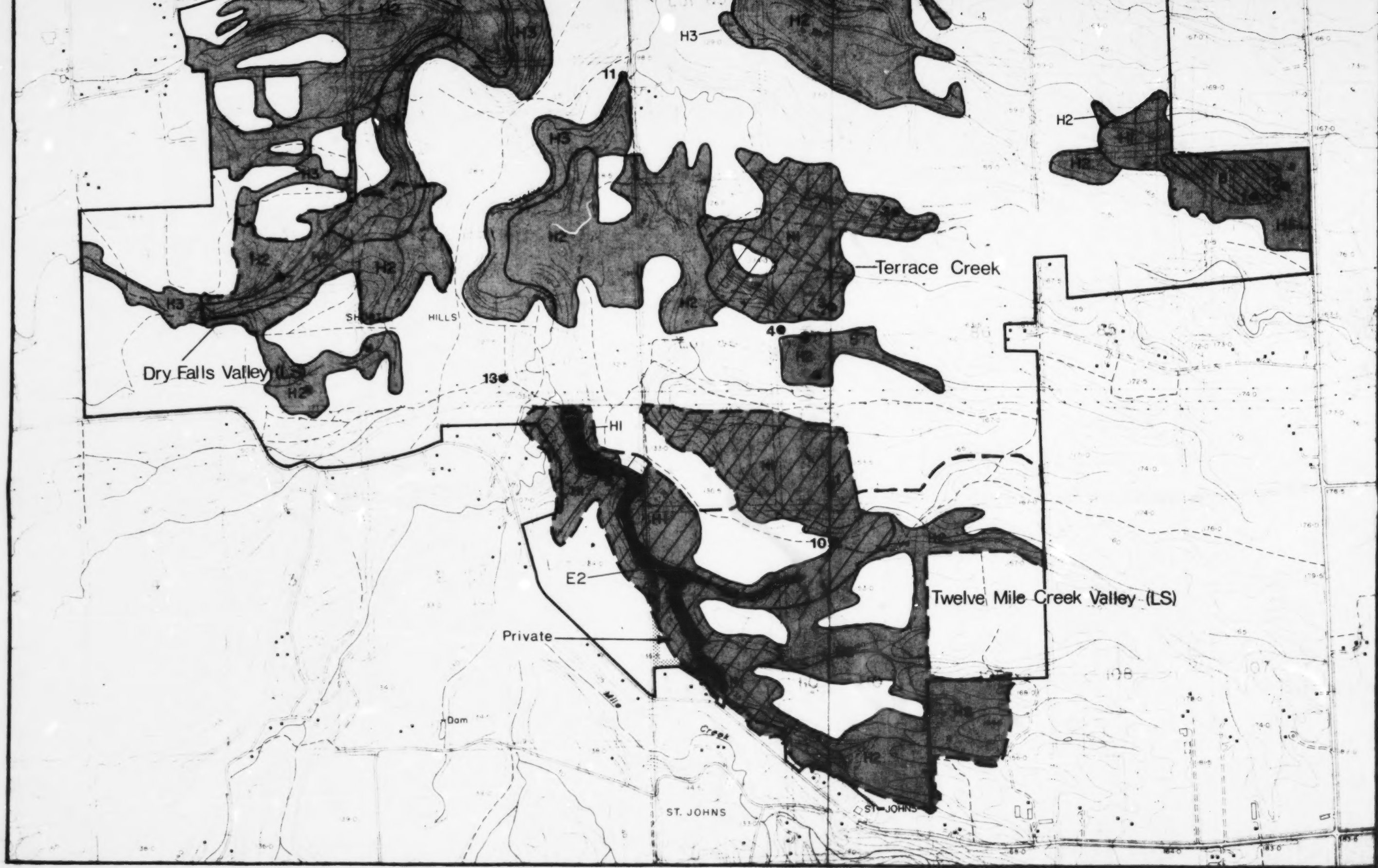
- Boundary of Short Hills Provincial Park
- Boundary of Existing Life Science Area of Natural and Scientific Interest
- Recommended Nature Reserve Zone (Life Science Areas of Natural and Scientific Interest)

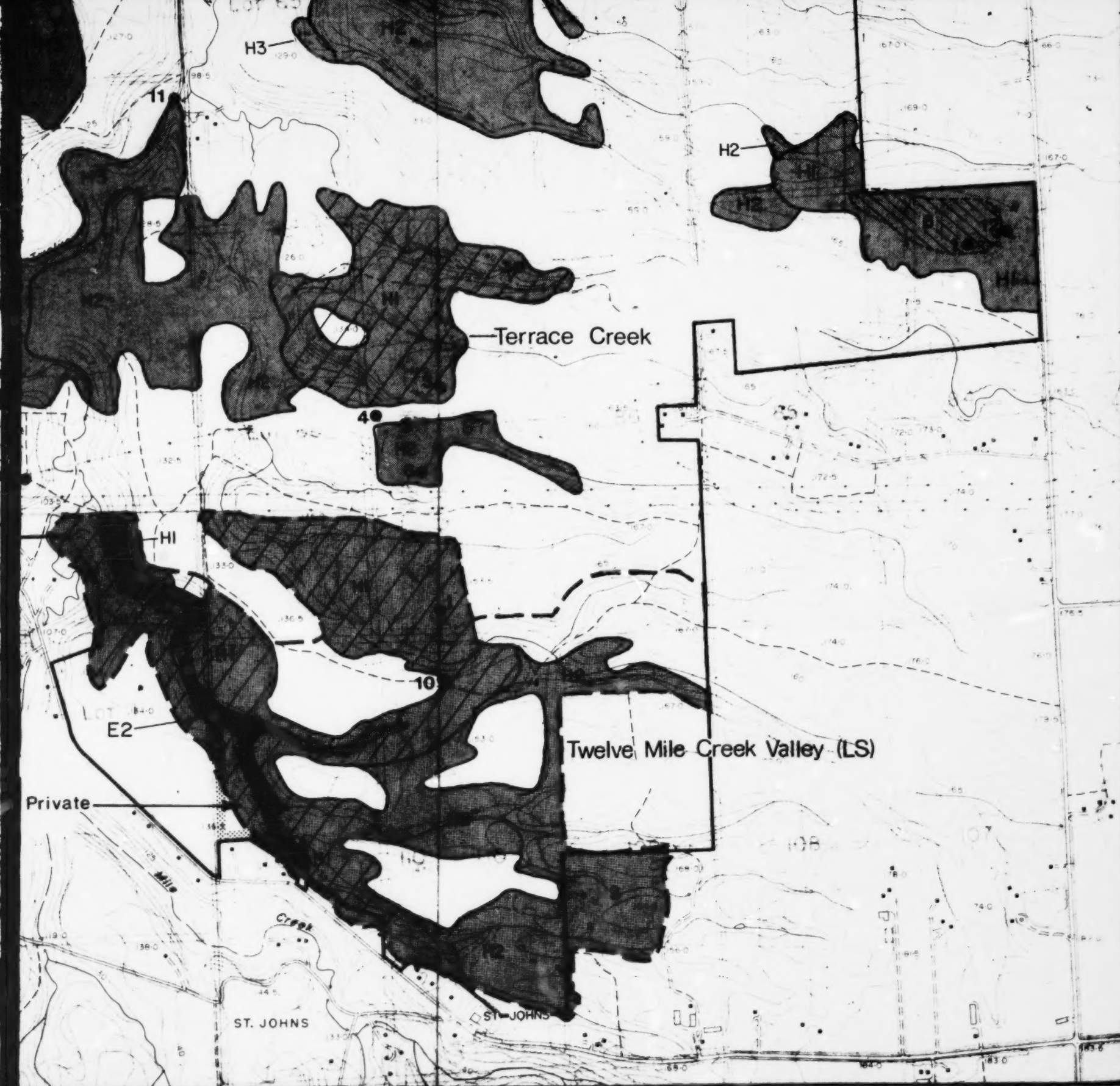
SIGNIFICANT FLORA

- 1 White Wood Aster (*Aster divaricatus*)
- 2 Narrow-leaved Spleenwort (*Athyrium pycnocarpon*)
- 3 American Chestnut (*Castanea dentata*)
- 4 Hay-scented Fern (*Dennstaedtia punctilobula*)
- 5 Hairy Wild-Rye (*Elymus villosus*)
- 6 Tulip Tree (*Liriodendron tulipifera*)
- 7 Green Violet (*Hybanthus concolor*) (1971 report only - loc. approx.)
- 8 Pawpaw (*Asimina triloba*) (1970 IBP - loc. approx.)
- 9 Burning-bush (*Euonymus atropurpureus*) (1970 IBP - loc. approx.)

SIGNIFICANT FAUNA

- 10 Blue-winged Warbler (*Vermivora pinus*)
- 11 Cliff Swallow (*Hirundo pyrrhonota*)
- 12 Pileated Woodpecker (*Dryocopus pileatus*)





- 3 American Chestnut (*Castanea dentata*)
- 4 Hay-scented Fern (*Denisiaedtia punctilobula*)
- 5 Hairy Wild-Rye (*Elymus villosus*)
- 6  Tulip Tree (*Liriodendron tulipifera*)
- 7 Green Violet (*Hybanthus concolor*) (1971 report only - loc. approx.)
- 8 Pawpaw (*Asimina triloba*) (1970 IBP - loc. approx.)
- 9 Burning-bush (*Euonymus atropurpureus*) (1970 IBP - loc. approx.)

SIGNIFICANT FAUNA

- 10 Blue-winged Warbler (*Vermivora pinus*)
- 11 Cliff Swallow (*Hirundo pyrrhonota*)
- 12 Pileated Woodpecker (*Dryocopus pileatus*)
- 13 Purple Finch (*Carpodacus purpureus*)

SENSITIVITY

-  Extreme
-  High

SIGNIFICANT AREAS

- E1 Marsh (Community type 1)
- E2 Mixed Forest (Community type 3)
- H1 Sugar Maple (Community type 2a, in part)
- H2 Sugar Maple (Community type 2a, in part)
- H3 Black Walnut (Community type 2c)
- H4 Black Maple (Community type 2f)

Prepared for:



Ministry Of
Natural
Resources

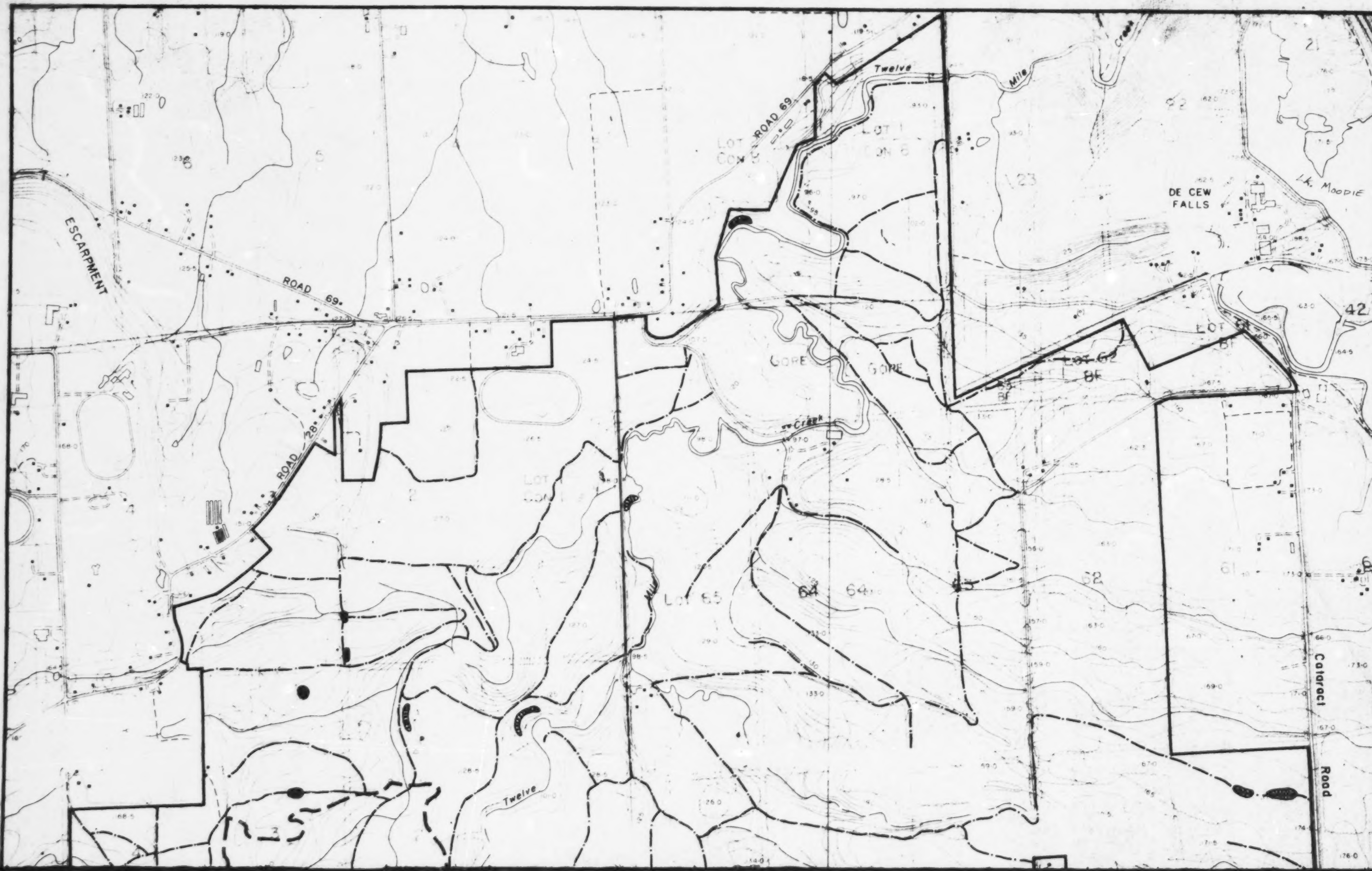
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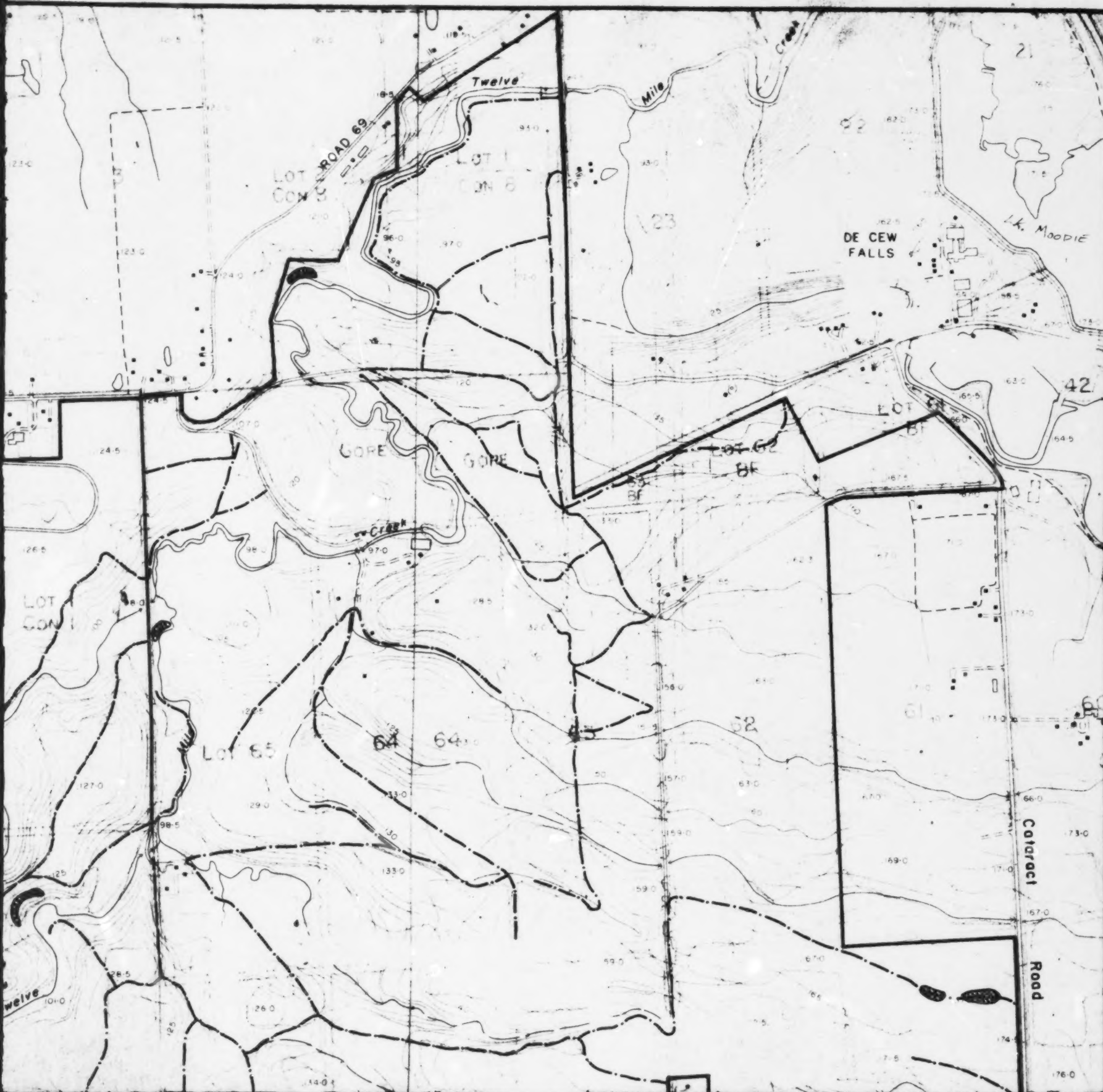


Gartner
Lee

GLL Project 88-227





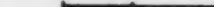


MAP 3

**TRAILS
OF
SHORT HILLS
PROVINCIAL PARK**

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Metres 100 0 200 400 Metres

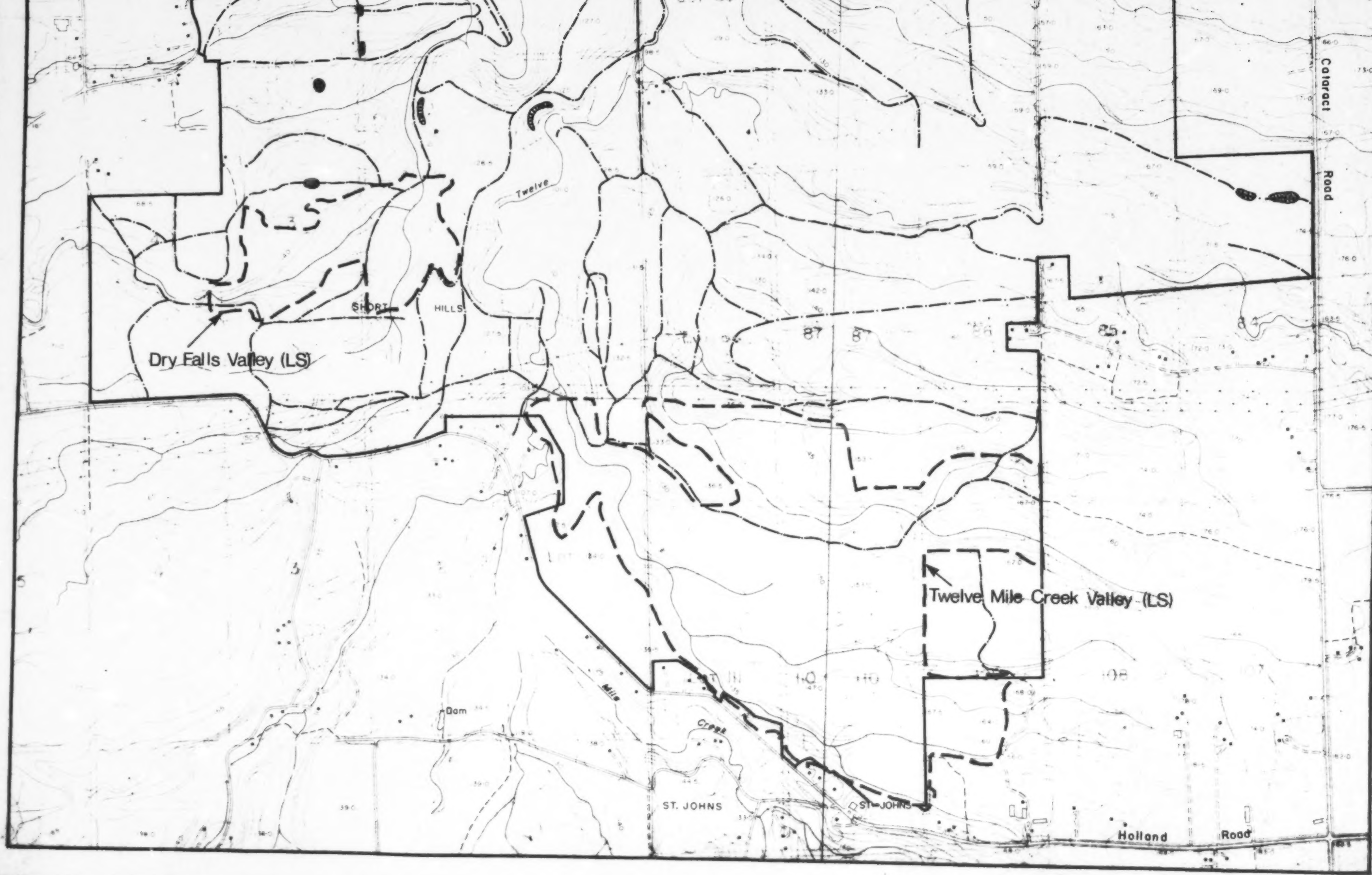


SYMBOLS

- Boundary of Short Hills Provincial Park
 - - - - - Boundary of Area of Natural and Scientific Interest (life science)
 - . - . - Ungraded Road or Trail

LEGEND

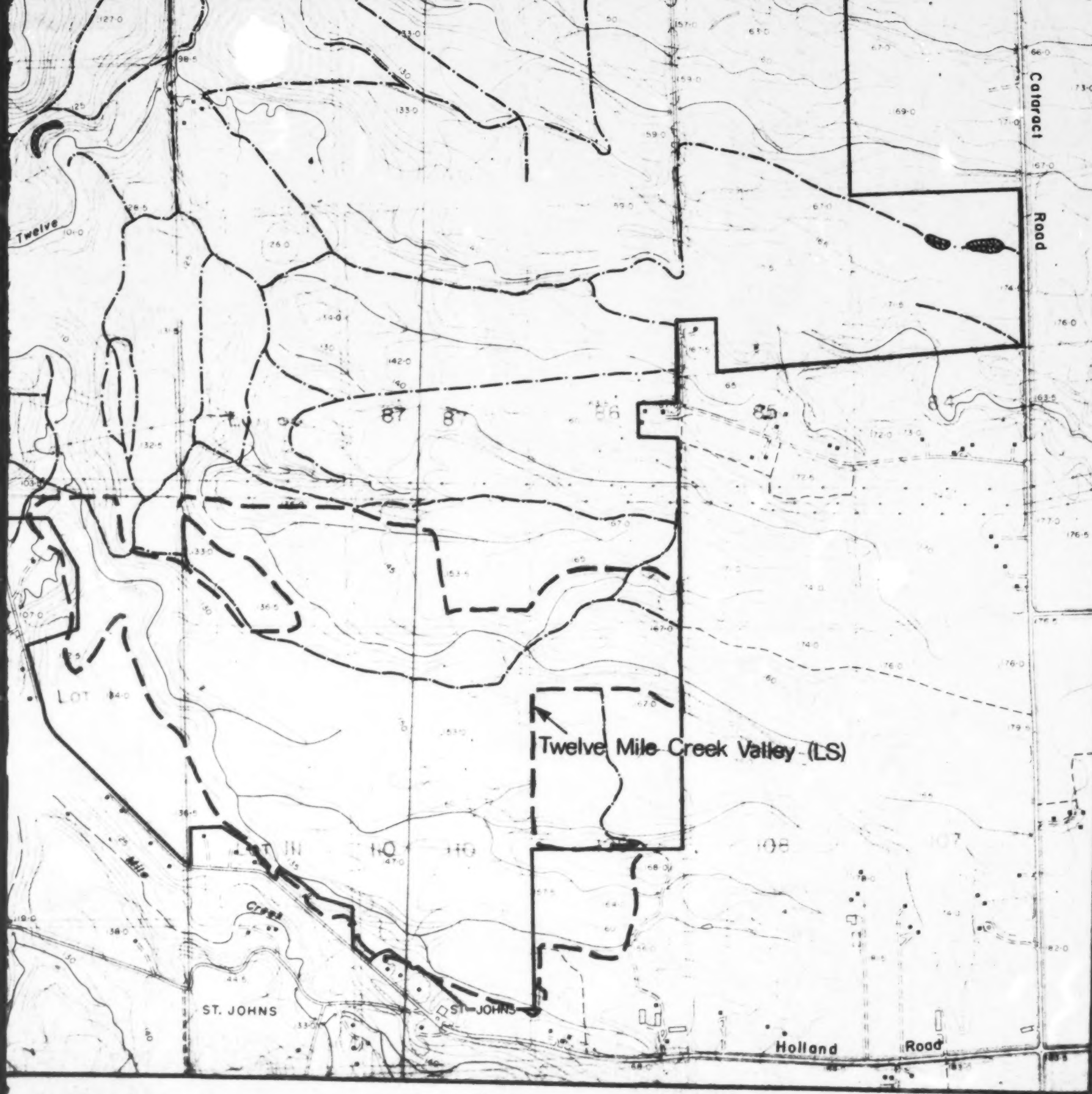
-  Slump
-  Rutting associated with ATV's
-  Erosion associated with horses



Prepared



Ontario



Rutting associated with ATV's



Erosion associated with horses



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Ministry Of
Natural
Resources

Prepared by :



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Lee

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